

THE JOURNAL OF SOCIAL PSYCHOLOGY

Political, Racial,
and Differential Psychology

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A NEUROTIC INVENTORY*

From the Psychological Laboratory of the University of Chicago

L. L. THURSTONE AND THELMA GWINN THURSTONE

COMPILATION OF THE SCHEDULE

The purpose of the present form is to obtain a fairly reliable index of the neurotic tendencies of university freshmen. In order to avoid an unfavorable attitude on the part of the subject the inventory was called "A Personality Schedule." It was compiled mostly from several shorter lists already published, including Woodworth's psychoneurotic inventory, House's monograph on this subject, Laird's schedules of questions, Freyd's list of questions about introversion and extroversion, and Allport's list of questions about ascendance-submission. Professor Woodworth's list is so well edited that we have not succeeded in making any improvement on it except for the increase in the length of the list whereby its reliability is raised.

The compilation was done by making a list of over 600 questions which were typewritten on separate cards. These were sorted into groups in accordance with the central idea of the question. When several questions were found which were aimed at the same information, the one was retained which seemed to be best edited for the purpose of the schedule. Duplication was allowed in some instances where an item of information, regarded as important, was incorporated in several questions that were differently phrased. However, the authors hope that such duplication of information in several questions has not been so extensive as to load the list seriously with any one narrow trait.

THE LIST OF QUESTIONS

In Table 1 we have a list of all the questions in the present form of the schedule. In the first column is an identification number which refers to the page, the column, and the number of the question in the column of the first printed experimental edition. Thus 3b-14

*Received in the Editorial Office, October 7, 1929.

means the 14th question in the second column of the third page of the experimental form. These identification numbers have been retained for the present description even though in the revised edition the questions will not retain the same numerical order.

In the second column are listed the actual questions. In front of each question there was printed *Yes No ?*, and the subject was instructed to ring one of the three answers for every question.

The printed instructions used for the freshmen were as follows:

PERSONALITY SCHEDULE

1928 Edition

Name
(Last Name) (Given Names or Initials)

In order that your advisers may help you in the best possible way it is desirable that they know something of your personality as well as of your intellectual ability and scholarship. The questions in this blank are intended to indicate various emotional and personality traits. Your answers may reveal a well-adjusted emotional life or they may show that you have some form of nervousness or worry which you may not yourself understand completely. If your answers show emotional maladjustment you will have the opportunity to get advice about this aspect of your development. If your answers reveal a well-adjusted personality, that fact will be known to your advisers.

This is not an examination. It is not a test in any sense because there are no right and wrong answers to any of the questions in this blank. Your admission to the University and your scholastic standing will not be affected in any way by your answers to these questions.

Your answers to particular questions will be confidential. They will be known only to two or three persons who will study these blanks and who will summarize your answers in a brief statement for your Dean. It has been found that some of the brightest students have emotional and personality difficulties which can be overcome with suitable counsel if the difficulties are known. It will therefore be to your own advantage to answer the questions as truthfully as possible.

In front of each question you will find: *yes no ?*

Draw a ring around one of these three answers for each question. Try to answer by "yes" or "no" if it is possible. If you are entirely unable to say even a tentative "yes" or "no" to the question, then draw a ring around the question mark.

TABLE 1

Number	Question	Neurotic answer	Frequency of maladjusted answer in	
			I	II
1a- 1	As a child did you like to play alone?	Yes	5	18
1a- 2	Do you usually control your temper?	No	2	17
1a- 3	Do you get stage fright?	Yes	5	35

1a- 4	Have your relationships with your mother always been pleasant?	No, ?	1	10
1a- 6	Are you troubled much by constipation?	Yes	0	9
1a- 8	Do you feel that life is a great burden?	Yes, ?	0	14
1a-10	Have you ever had the habit of stuttering?	Yes	1	6
1a-11	Do you get on well with your brothers and sisters?	No, ?	0	9
1a-13	Does your heart sometimes sound in your ears so that you cannot sleep?	Yes	0	15
1a-14	Do you take responsibility for introducing people at a party?	No	2	30
1a-15	Do you think most people are self-seeking or malicious?	Yes	4	13
1a-16	Do you find it difficult to get rid of a salesman?	Yes	4	31
1a-17	Do you have difficulty in starting a conversation with a stranger?	Yes	3	30
1a-18	Do you lose your head easily in a dangerous situation?	Yes	0	12
1b- 1	Do you laugh easily?	No	5	16
1b- 2	Do you worry too long over humiliating experiences?	Yes	1	40
1b- 3	Are you careful not to say things to hurt people's feelings?	No	1	14
1b- 4	Are you sometimes the leader at a social affair?	No	6	32
1b- 5	Are your day-dreams about improbable occurrences?	Yes	4	30
1b- 7	Do you usually get turned around in new places?	Yes	5	26
1b- 8	Do you often feel lonesome, even when you are with other people?	Yes	1	42
1b- 9	Do you love your father more than your mother?	Yes	1	5
1b-10	Do you consider yourself a rather nervous person?	Yes	0	32
1b-11	Are you afraid of falling when you are on a high place?	Yes	4	35
1b-13	Are you interested in meeting a lot of different kinds of people?	No	2	8
1b-15	Do a great many things frighten you?	Yes	0	13
1b-16	Have you ever had a nervous breakdown?	Yes, ?	0	5
1b-17	Are your feelings easily hurt?	Yes	2	37
1b-18	Are you easily shocked by sexual topics, <i>risqué</i> stories, and the like?	Yes	2	12
1b-19	Do you keep in the background on social occasions?	Yes	0	32
2a- 1	Do ideas often run through your head so that you cannot sleep?	Yes	4	42
2a- 3	Do you have the habit of leaving a lot of tasks unfinished?	Yes	0	20

2a-4	Have you found books more interesting than people?	Yes	5	30
2a-7	Are you frequently bothered by indigestion?	Yes	0	7
2a-8	Are you ever bothered by the feeling that things are not real?	Yes, ?	8	33
2a-9	Are there many people that you dislike intensely?	Yes	1	13
2a-10	Do you ever feel an awful pressure in or about the head?	Yes	0	11
2a-11	Are you usually cool and composed in a dangerous situation?	No	2	14
2a-12	Are you frequently burdened by a sense of remorse?	Yes	0	39
2a-13	Do people think you are selfish?	Yes	1	14
2a-14	Does it upset you to lose in a competitive game?	Yes	1	20
2a-15	Can you sit still without fidgeting?	No	3	23
2a-16	Do you usually trust people?	No	2	11
2a-17	Do you lose your temper quickly?	Yes	3	20
2a-18	Is your mother's nature usually cheerful?	No	1	12
2a-20	Do you get rattled easily?	Yes	0	22
2a-21	Do you worry over possible misfortunes?	Yes	2	37
2a-22	Do you usually feel fatigued when you wake up in the morning?	Yes	0	18
2a-23	Can you stand disgusting smells?	No	8	36
2a-25	Do you ever talk in your sleep?	Yes	5	13
2a-26	Does it make you uneasy to go into a tunnel or subway?	Yes	0	11
2a-27	Do your feelings alternate between happiness and sadness without apparent reason?	Yes	5	41
2a-29	Are you often afraid of contracting disease?	Yes	2	14
2a-30	Do you get tired of amusements quickly?	Yes	2	21
2a-31	Are you frequently worried about religion?	Yes	2	22
2a-32	Have you ever had an arm or leg paralysed?	Yes, ?	1	4
2a-33	Are you troubled with shyness?	Yes	0	33
2a-34	Have you ever been afraid of going insane?	Yes, ?	0	20
2a-35	Do you like indoor sports better than outdoor sports?	Yes	2	16
2a-36	Did you ever have St. Vitus's dance?	Yes	0	2
2a-38	Do people find fault with you more than you deserve?	Yes	0	9
2a-39	Do you find it necessary to watch your health carefully?	Yes	2	19
2a-40	Are you often frightened in the middle of the night?	Yes	0	16

2a-42	Does it make you uneasy to sit in a small room with the door shut?	Yes	1	8
2a-44	Have you ever seen a vision?	Yes	2	5
2a-46	Do you often have bad pains in any part of your body?	Yes	2	15
2b- 1	Do you know of anybody who is trying to do you harm?	Yes	0	2
2b- 2	Have you ever been afraid that you are sexually inferior to other men (other women)?	Yes	1	21
2b- 3	Were your parents partial to any of your brothers or sisters?	Yes, ?	1	11
2b- 4	If you come late to a meeting would you rather stand or leave than take a front seat?	Yes	7	33
2b- 5	Did you ever have a strong desire to commit suicide?	Yes, ?	0	18
2b- 7	Do you tend to nonconformity in your political, religious, and social beliefs?	Yes	6	27
2b-10	Do you day-dream frequently?	Yes	3	40
2b-11	Did you have a happy childhood?	No	1	8
2b-12	Have you occasionally had to resist an impulse to take things that were not yours?	Yes, ?	1	10
2b-13	Have you ever been afraid that you might jump off when you were on a high place?	Yes	2	24
2b-14	Were you your parents' favorite child?	Yes	3	12
2b-15	Have you ever had spells of dizziness?	Yes	2	31
2b-16	Do you get discouraged easily?	Yes	0	38
2b-17	Do you often say things on the spur of the moment and then regret them?	Yes	11	44
2b-18	Have your relationships with your father always been pleasant?	No, ?	1	17
2b-19	Do you have a great many bad headaches?	Yes	0	8
2b-20	Is there anyone you want to get even with?	Yes	1	11
2b-21	Does it make you uneasy to cross a bridge over a river?	Yes	0	12
2b-22	Do your interests change quickly?	Yes	2	33
2b-24	Did you ever have a strong desire to run away from home?	Yes	1	18
2b-25	Did you ever have convulsions?	Yes, ?	0	2
2b-26	Can you stand pain quietly?	No	4	15
2b-28	Do you like to be by yourself a great deal?	Yes	7	30
2b-29	Are you easily moved to tears?	Yes	1	33
2b-32	Do you allow people to crowd ahead in line?	Yes	9	30
2b-34	Do you dread the sight of a snake?	Yes	6	27
2b-36	Did you ever have heart trouble?	Yes	2	12
2b-37	Does it bother you to have people watch you at work even when you do it well?	Yes	5	40

2b-38	Do you limit your friendships mostly to your own sex?	Yes	5	26
2b-39	Do you like to take on responsibilities?	No	1	20
2b-40	Have you ever felt as if someone were hypnotizing you and making you act against your will?	Yes, ?	0	8
2b-41	Can you stand criticism without feeling hurt?	No	0	25
2b-42	Do you have difficulty in making friends?	Yes	0	25
3a- 1	Are you troubled with the idea that people are watching you on the street?	Yes	2	30
3a- 2	Have you had a strong impulse to go and set fire to something?	Yes, ?	0	2
3a- 3	Has any of your family been insane, epileptic, or feeble-minded?	Yes	0	2
3a- 5	Are your day-dreams usually about unpleasant things?	Yes	0	2
3a- 6	Can you do the little chores of the day without worrying over them?	No	0	13
3a- 7	Were you happy when fourteen to eighteen years old?	No, ?	2	24
3a- 8	Are you afraid when you have to take drugs?	Yes	0	12
3a-10	Have you been the scapegoat in the family life?	Yes	1	7
3a-12	Does your mind often wander badly so that you lose track of what you are doing?	Yes	0	32
3a-13	Do you have the sensation of falling when going to sleep?	Yes	0	16
3a-15	Do your eyes often pain you?	Yes	1	14
3a-16	Do you frequently talk to yourself?	Yes	0	13
3a-17	Can you stand kidding?	No	0	15
3a-20	Are you absent minded?	Yes	1	21
3a-21	Do you have a great fear of fire?	Yes	0	14
3a-22	Do you make friends easily?	No	1	22
3a-23	Have your employers generally treated you right?	No	0	3
3a-25	Do you feel tired most of the time?	Yes	0	13
3a-26	Do you have great difficulty in finding your way around in the dark?	Yes	0	14
3a-27	Are you ever bothered by the feeling that people are reading your thoughts?	Yes	0	17
3a-28	Do you have the habit of contradicting people?	Yes	4	26
3a-29	Do you prefer participation in competitive intellectual amusements to athletic games?	Yes	6	24
3a-30	Were your parents happily married?	No, ?	0	14
3a-31	Do you think you are often regarded as queer?	Yes	0	20
3a-32	Have you ever been depressed because of low marks in school?	Yes	2	30

3a-33	Would you say that you are more or less ignorant of sex?	Yes	2	12
3a-34	Do you often feel that you do not get your chance in social conversation?	Yes	1	17
3a-35	Are you touchy on various subjects?	Yes	1	31
3a-36	Would you say that you are cynical about members of the opposite sex generally?	Yes	0	26
3a-37	Are you troubled by thoughts of death?	Yes, ?	3	12
3a-39	Do you find it difficult to pass urine in the presence of others?	Yes	1	18
3a-40	Have your friends ever turned against you?	Yes	1	16
3b- 1	Have you ever been blind, half-blind, deaf, or dumb for a time?	Yes, ?	1	2
3b- 3	Are you physically inferior to your associates?	Yes	0	14
3b- 4	Has any of your family committed suicide?	Yes, ?	0	2
3b- 6	Are you troubled with poor health?	Yes	0	33
3b- 7	Are you often in a state of excitement?			
3b- 8	Is there a conflict in your nature between sex and morality?	Yes	0	1
		Yes	1	24
3b- 9	Do you ever cross the street to avoid meeting somebody?	Yes	6	39
3b-10	Do you frequently feel grouchy?	Yes	0	30
3b-12	Do you like to be with other people a great deal?	No	1	23
3b-13	Can you stand the sight of blood?	No	0	12
3b-14	Are you usually in good spirits?	No	0	9
3b-15	Do you think people have made quite a lot of fun of you?	Yes	0	8
3b-16	Have you been bothered by vomiting?	Yes	0	7
3b-17	Do you feel self-conscious when you recite in class?	Yes	2	36
3b-18	Are you thrifty and careful about making loans?	No	0	20
3b-20	Is your mother dissatisfied with her lot in life?	Yes, ?	4	18
3b-21	Do things often go wrong for you by no fault of your own?	Yes	1	28
3b-22	Do you think you know yourself well from having observed your own mind?	No	2	15
3b-23	At a reception or tea do you seek to meet the important person present?	No	5	30
3b-24	Do you ever have a queer feeling as if you were not your old self?	Yes, ?	9	42
3b-25	Do you often feel just miserable?	Yes	0	40
3b-27	Does some particular useless thought keep coming into your mind to bother you?	Yes	0	35
3b-28	Are you bothered much by blushing?	Yes	1	25
3b-29	Is your head likely to ache on one side?	Yes	0	9
3b-30	Are you a "crank" about food?	Yes	3	18

3b-31	When you were young did the other children regard you as "different"?	Yes	2	13
3b-32	Do you get upset easily?	Yes	0	27
3b-33	Do you love your mother more than your father?	Yes	5	16
3b-35	Are you frequently troubled with nightmares?	Yes	1	6
3b-36	Do you hesitate to volunteer in a class recitation?	Yes	1	29
3b-37	Do you usually feel well and strong?	No	0	8
3b-38	Do you get tired of work quickly?	Yes	0	25
3b-39	Do you frequently feel that you deserve a better lot than you have?	Yes	1	20
3b-41	Has any of your family had a drug habit?	Yes	0	0
3b-42	Do you usually sleep well?	No	1	10
4a- 1	Are you systematic in caring for your personal property?	No	1	19
4a- 2	Are you frequently in low spirits?	Yes	0	30
4a- 3	Do you enjoy social gatherings just to be with people?	No	4	27
4a- 4	Do you find your way about easily?	No	0	16
4a- 5	Are you shy with boys?	Yes	0	23
4a- 6	Are you shy with girls?	Yes	0	21
4a- 7	Do you mind having your friends see you in the ten-cent store?	Yes	1	17
4a- 8	Do you feel that you are not satisfactorily adjusted to life?	Yes	0	23
4a- 9	Do you dislike to write about yourself even to very close friends?	Yes	3	23
4a-10	Have you ever had the habit of twitching your face, neck, or shoulders?	Yes, ?	0	18
4a-11	Do you often experience periods of loneliness?	Yes	1	39
4a-13	Does criticism disturb you badly?	Yes	0	25
4a-14	Do you feel well rested in the morning?	No	0	15
4a-15	Do you ever take the lead to enliven a dull party?	No	4	33
4a-16	Do you often feel self-conscious in the presence of superiors?	Yes	4	45
4a-17	Do you get tired of people quickly?	Yes	0	21
4a-18	Would you rather work indoors than outdoors?	Yes	4	23
4a-19	Do you lack self-confidence?	Yes	1	35
4a-21	At night are you frequently troubled by the idea that somebody is following you?	Yes	0	9
4a-22	Do you think you are usually unlucky?	Yes	4	20
4a-23	Do you find it difficult to speak in public?	Yes	3	36
4a-25	Was your mother the dominant member of the family?	Yes	3	13
4a-26	Do you sometimes have shooting pains in the head?	Yes	0	10

4a-27	Do you like to solve puzzles?	No	1	17
4a-29	Do you often have queer, unpleasant feelings in any part of your body?	Yes	0	13
4a-30	Do you usually plan your work ahead?	No	2	17
4a-31	Do you usually keep in fairly uniform spirits?	No	0	22
4a-32	Are you frightened by lightning?	Yes	2	16
4a-33	Do you often feel self-conscious because of your personal appearance?	Yes	5	39
4a-34	If you see an accident are you quick to take an active part in giving help?	No	3	26
4a-35	Do you feel you must do a thing over several times before you leave it?	Yes	3	29
4a-36	Did you ever have anemia badly?	Yes	0	5
4b- 2	Does it make you uneasy to have to cross a wide street or open square?	Yes	0	23
4b- 3	Do you easily learn to find your way about in new places?	No	0	15
4b- 4	Are you troubled with feelings of inferiority?	Yes	0	36
4b- 6	Do you often find that you cannot make up your mind until the time for action has passed?	Yes	0	35
4b- 7	Do you often have the feeling of suffocating?	Yes	0	5
4b- 8	Have you any physical defects?	Yes	1	12
4b- 9	Do you think you are regarded as critical of other people?	Yes	4	32
4b-10	Do you have ups and downs in mood without apparent cause?	Yes	1	38
4b-12	Do you let yourself go when angry?	Yes	3	24
4b-13	Do things ever swim or get misty before your eyes?	Yes	0	19
4b-15	Do you often get interested in people you meet?	No	1	10
4b-16	Have you a good appetite?	No	0	4
4b-17	Have you ever lost your memory for a time?	Yes, ?	0	3
4b-18	Is your home environment happy?	No, ?	1	13
4b-20	Are you bothered by fluttering of the heart?	Yes	0	11
4b-21	Are you slow in making decisions?	Yes	7	29
4b-22	Were you considered a bad boy (or girl)?	Yes	0	5
4b-23	Do you faint easily?	Yes	0	2
4b-24	Has your family always treated you right?	No, ?	0	11
4b-28	Since you were five years old have you ever had the habit of wetting the bed?	Yes, ?	2	6
4b-29	Are you frequently troubled with the fear of being crushed in a crowd?	Yes	0	3
4b-30	Are you in general self-confident about your abilities?	No	0	31

4b-32	Do you occasionally have conflicting moods of love and hate for members of your family?	Yes, ?	2	34
4b-33	Are you generally regarded as indifferent to the opposite sex?	Yes	2	26
4b-34	Do you ever walk in your sleep?	Yes	0	1

SCORING OF THE ANSWERS

Since the purpose of the schedule was to obtain a single numerical index of the neurotic tendency of the subject, the answers were scored with this in mind. The scoring method was developed as follows. The authors first read each of the questions, indicating for each one the manner in which the neurotic person would be most likely to answer it. This was, of course, subject to error in that the first tentative scoring depended on the personal opinions of the authors about each question. But the tentative scoring has been checked by the criterion of internal consistency which will be described. The doubtful questions and the informational questions were not included in the first tentative scoring.

The Personality Schedule was filled in by 694 University of Chicago freshmen during freshman week in September, 1928, on the same day that they were given the Psychological Examination of the American Council on Education. The 694 schedules were first scored by counting the total number of neurotic answers in each schedule, as these were determined tentatively by the authors. The 50 most neurotic subjects (Group II) and the 50 least neurotic subjects (Group I) were selected by means of this tentative scoring. For each question we counted the number of neurotic answers in Group I and in Group II. Now, if the questions were properly scored, there should be a much greater number of neurotic answers in Group II than in Group I. There was only one inversion in the 223 questions, which indicated that the authors made an error in the tentative marking of one question. They had hardly expected to guess so well.

There is considerable overlapping among the concepts of nervousness, emotional instability, social maladjustment, neurotic tendency, and psychopathological traits. Our central idea was to score each question with reference to social and emotional maladjustment, and it seems to be indicated that psychopathological traits are associated with the more severe forms of emotional mal-

adjustment. There seems to be a gradation between the psychopathological traits at one extreme, through the neurotic indicators, to the more common forms of minor social and emotional maladjustment. We have assumed such a gradation and it seems to be justified by our results.

In the third column of Table I are listed the neurotic or maladjusted answers to each question. Since there were three choices, *yes*, *no*, and *?*, it happened for some questions that more than one answer was considered to be maladjusted. For example, the question 3a-30 reads "Were your parents happily married?" The unfavorable answer to this question, as far as the child's emotional life is concerned, is evidently "No," but in scoring the blank the answer "?" was also considered to be unfavorable. It probably represented frequently an unwillingness to admit dissension or unhappiness in the family. Of course, it is possible that some of these doubtful answers were returned by subjects who interpreted the question so literally that they refused to answer for their parents whether they were happily married. More frequently the doubtful answer to such questions means an unwillingness to acknowledge an unfavorable situation. If either of these two answers was ringed by the subject it was counted as unfavorable. This double scoring was used only for those questions in which the doubtful answer was thought to mean the avoidance of some unfortunate fact. Other examples are: "Is your mother dissatisfied with her lot in life?", "Do you get on well with your brothers and sisters?" A doubtful answer to this question evidently means that the subject does not get on so very well with his brothers and sisters.

It will be noticed that the questions were so worded that the neurotic or emotionally unstable answer was sometimes the affirmative and sometimes the negative. The subjects were asked to ring one answer to every question in the whole schedule.

The last two columns of Table I show the number of neurotic answers in Group I and in Group II. It will readily be seen that the number of maladjusted answers is always considerably larger in Column II than in Column I.

The total score on the Personality Schedule is the total number of unfavorable or maladjusted answers that the subject returned. A numerically high score represents therefore an emotionally un-

stable personality which has many of the specific traits described by various writers as neurotic personality. A numerically low score indicates the absence of emotional strains or worries, an emotionally well-adjusted personality. The maximum possible score was, of course, 223, since that would be the score if every one of the questions was answered in the unfavorable way. The actual range of scores in the freshman class was from 5 to 134 neurotic answers. The most unfavorable score of 134 represents a student who answered over half of the questions in the unfavorable manner.

THE CRITERION OF INTERNAL CONSISTENCY

A number of doubtful questions were omitted from the first tentative scoring of the blanks. The retention or exclusion of a question was determined in each case by the ratio of the number of unfavorable answers in Column I and the corresponding number in Column II. This is an application of the criterion of internal consistency which the authors consider to be more essential in establishing the validity of the schedule than correlations with the available outside criteria. As a matter of fact, no suitable outside criterion was available for the entire incoming freshman class. Certainly scholarship grades constitute no index of neurotic personality. Nor could the intelligence ratings be used for this purpose. Teachers' estimates of neurotic personality would be useless, even if they were available, because there is no common conception of what might be meant by neurotic personality. It is not even necessary for the authors to define it closely, because the present list of questions represents the effort of various authors to summarize in question form the principal characteristics of a neurotic personality as it has been described by numerous psychiatrists and psychologists.

The criterion of internal consistency as applied to the present schedule consists in the observation that all of the frequencies in Column II are considerably greater than the corresponding frequencies in Column I. This proves that the manner in which the answers were scored for the total schedule was at least consistent. This criterion also proves that there is a common core of some kind throughout the questions that were retained, and, since they were all written as a summary of textbook descriptions of

neurotic personality, we have good reason to believe that the trait which is indicated by the total score here is what would be generally understood as neurotic personality. A number of the doubtful questions were eliminated by this criterion, and some of them were retained.

It is of course possible that many of the students who filled in this schedule intentionally withheld the truth about themselves. With a little sophistication they could easily do so and thereby earn a score on the Personality Schedule which would give the appearance of a well-adjusted emotional life. We have no guarantee that this was not frequently done except the apparent seriousness of the freshmen at the time they were filling in these schedules. In writing the instructions, we intentionally described the emotionally unstable student as favorably as possible as regards talent, intelligence, and scholarship in order to invite frankness about emotional difficulties. We also indicated in the instructions that psychiatric consultations would be provided if asked for. It was also guaranteed that the individual papers would be kept confidential. All of these features of the instructions were inserted with the hope of inviting frankness and honesty.

But even with these precautions, there is no guarantee that many of the students did not misrepresent themselves in the schedule in order to attain a favorable score. We can be certain about one thing, however, namely, that those students who had a high numerical score, answering a large number of questions in the unfavorable manner, were certainly telling the truth about themselves. We found no indication that the schedule was treated facetiously at the time it was being filled in by the freshmen. If there was falsification, it was at the favorable end of the range of scores and not at the unfavorable end. Our primary interest is in the unfavorable end of the scale. If we succeed in finding many of the neurotic personalities among the freshmen for psychiatric consultation or supervision, it will be something gained even if the rest of the neurotic students escaped notice by falsifying their schedules of answers.

A further check of a practical and informal sort has been obtained by the authors and others who have had occasion to interview students from both of the extremes of the scale. The difference between these two groups of students is striking. The

bearing, facial expression, and conversation of the students at the two extremes are strikingly different, but we should certainly not care to rely on interview impressions for the middle and less extreme ranges of the scale.

FREQUENCY DISTRIBUTIONS

We turn next to the frequency distributions of the total scores. It will be remembered that the total score for the Personality Schedule is the total number of neurotic answers returned by the subject. The maximum is 223, since there are so many questions in the schedule. We found that there was a variation in total score of from 5 to 134. It may be significant that they filled in these schedules during freshman week before the opening of the University in September. We are very doubtful whether so serious an attitude could be obtained with a class of seniors. If the subjects should take the schedule as a joke or if they were indifferent to the purposes of the schedule, the scores would be of little value except in individual cases. For this reason, one should be very cautious in comparing the frequency distributions of scores for groups of subjects who have been given this schedule in different situations and on different occasions. All of the groups to be compared in the present study were given the Personality Schedule at the same time so that the comparisons of the subgroups ought to be legitimate. It is doubtful whether comparisons can be made between freshmen at different institutions, unless the differences are fairly large and unless one can be pretty sure that the attitudes of the groups to be compared were similar.

In Table 2 we have the frequency distributions of total scores in the Personality Schedule for University of Chicago freshmen. The first three distributions show respectively the frequencies for freshman men, freshman women, and for the total freshman class, men and women combined. The next set of three distributions represent the freshman fraternity men, the freshman fraternity women, and the fraternity freshmen, men and women combined. The third set of distributions represent the freshman Jews in a similar manner.

RELIABILITY OF THE SCHEDULE

The reliability of the total score was estimated by the corre-

lation between parallel halves of the schedule. It so happened that on each of the four pages of the printed schedule there were two columns of questions. The total number of neurotic answers on the left columns of the four pages was compared with the total number of neurotic answers returned on the right columns of the schedule. The correlation between these two parallel halves of the schedule was found to be $+0.897$, and the estimated reliability coefficient for the whole schedule is, therefore, 0.946 , which is higher than one might expect for material of this sort. We conclude, therefore, that the reliability of the whole schedule of 223 questions

TABLE 2
FREQUENCY DISTRIBUTIONS FOR THE PERSONALITY SCHEDULE

Personality score	Freshmen			Freshman fraternity members				Freshman Jews		
	Men	Women	Total	Men	Women	Total		Men	Women	Total
0	8	3	11	3		3		1		1
5	18	7	25	3		3		6	1	7
10	20	13	33	3	2	5		4	1	5
15	40	14	54	13	3	16		7	5	12
20	43	26	69	14	4	18		7	3	10
25	40	31	71	8	5	13		6	6	12
30	51	31	82	16	4	20		10	3	13
35	26	22	48	4	1	5		7	4	11
40	22	26	48	4	3	7		4	4	8
45	21	27	48	3	7	10		6	5	11
50	22	23	45	2	4	6		5	7	12
55	22	19	41	4	3	7		2		2
60	11	15	26	1	2	3		4	2	6
65	7	9	16	2	1	3		1	1	2
70	8	9	17	1		1		2	1	3
75	6	11	17	2	1	3			2	2
80	8	4	12		1	1		3		3
85	3	2	5	1		1		1	1	2
90	3	6	9						1	1
95	3	4	7					1		1
100	2	2	4						1	1
105		3	3						1	1
110										
115										
120	2		2							
125										
130										
135	1		1					1		1
	387	307	694	84	41	125		78	49	127

is close to 0.95 and that if only half of the schedule is used the reliability may be expected to be close to 0.90.

EXTROVERSION-INTROVERSION IN THE SCHEDULE

The first experimental list of questions contained about 60 items that were collected from sources dealing primarily with extroversion and introversion. It was not our purpose to deal with this variable, since we were primarily interested in the neurotic personality. However, these 60 extroversion-introversion items were examined by the criterion illustrated in the last two columns of Table 1 in order to ascertain which of these items belong legitimately in this schedule. We found that some of the introversion items and a few of the extroversion items satisfied the criterion of internal consistency, and they were included. The neurotic personality as defined by the present schedule is therefore more similar to introversion than to extroversion, and this is probably what one would expect.

SEX DIFFERENCES

In Table 2 we have the frequency distributions for men and women, and in Table 3 the constants for these distributions are summarized. The first comparison of Table 3 relates to men and women in the University of Chicago freshman class. The mean score for the men was 37.32, and the mean score for the women was 43.82. The standard deviations of the two distributions are also listed, the difference d between the two means, the probable error of this difference, and the ratio between the difference and its probable error. The ratio is 5.64 for the comparison between men and women. The difference may be regarded as certainly not due to chance errors of sampling. There are two possible interpretations that occur to us. The difference between the mean scores for men and women may be interpreted directly by its face value, which would lead to the conclusion that the women students are more frequently neurotic, or more neurotic on the average, than the men students. A second alternative is that the women are more likely to tell about the idiosyncracies of their personalities than the men, so that the neurotic score for the women is higher on that account.

FRATERNITY AND NON-FRATERNITY STUDENTS

The next comparison is between the fraternity men and the non-fraternity men in the freshman class. The list of fraternity men

does not include the total number of freshmen who will join fraternities, but it does include those freshmen who had been pledged by April, 1929, to a fraternity. The mean score for the fraternity men was 31.67, while the mean score for the non-fraternity men was 38.89, which shows that the freshmen who joined a fraternity a few months after filling in this schedule returned fewer neurotic answers than those who did not join fraternities. The ratio between the difference of these two means and the probable error of the difference is 4.53 so that we may regard the difference as certainly not due to chance. Our inference is that a freshman with neurotic tendencies has a lower probability of becoming a fraternity man than his better-adjusted classmates. Evidently the neurotic personality is identified by other students, and it is avoided in seeking fraternity material. It is interesting to note in Table 2 that none of the extremely neurotic freshmen was elected to fraternity membership.

In Table 3 is also summarized a similar comparison of the scores for the fraternity women and non-fraternity women in the freshman class. The ratio of the difference between means and the probable error of this difference is here 1.77, which is lower than that for the men. The inference is here also that the women's clubs discriminate against the neurotic personality in selecting their membership, although the discrimination does not seem to be so effective as with the men. One might speculate as to whether the women students hide their neurotic tendencies better than the men, whether neurotic tendencies are regarded less unfavorably by the women's clubs, or whether they "sample" less adequately their proposed members. In both of these comparisons, however, it is evident that neurotic tendencies tend to be avoided by fraternities and clubs.

JEWS AND GENTILES

It has been said that the Jews have neurotic difficulties more frequently than Gentiles. We made a list of the freshmen who recorded their religion on the application blanks for admission to the University. This, we are sure, does not represent all of the Jews in the freshman class, but it does represent a fairly large number of them. We found the average personality score for the Jewish men in the freshman class to be 38.40, which we compare with the average of the remainder of the freshman men whose score is 37.05. The ratio of the difference and the probable error of the difference is only 0.67,

which indicates that the Jewish men are slightly more neurotic than the Gentiles but that the difference is not large enough to warrant any sweeping conclusions about the neurotic tendencies of the Jews. The last comparison of Table 3 relates to the Jewish women, who are there compared with the average for the remainder of the freshman women. The difference is not large enough to warrant any confidence. In both of the comparisons, for Jewish men and Jewish women, the indications are, however, that the Jews are probably slightly more neurotic on the average than the freshman class as a whole.

TABLE 3
GROUP COMPARISONS BY MEANS OF THE PERSONALITY SCHEDULE

Freshmen groups	No.	m	σ	d	P.E. diff.	Diff. P.E. diff.
Men	387	37.32	22.44			
Women	307	43.82	22.27	6.50	1.15	5.64
Fraternity men	84	31.67	17.84			
Non-fraternity men	303	38.89	23.32	7.22	1.59	4.53
Fraternity women	41	40.67	17.24			
Non-fraternity women	266	44.30	22.91	3.63	2.05	1.77
Jewish men	78	38.40	24.00			
Gentile men	309	37.05	22.02	1.35	2.02	.67
Jewish women	49	44.34	23.03			
Gentile women	258	43.72	22.12	.62	2.41	.26

CORRELATIONS WITH INTELLIGENCE AND SCHOLARSHIP

Since the entire freshman class took an intelligence examination at the same time that they filled in the Personality Schedule, it is of interest to ascertain any possible relation between intelligence and neurotic disposition. The correlation between scores on the intelligence test of the American Council of Education and the score on the Personality Schedule was found to be +0.037, which indicates that there is nothing in common between the two scores. We are therefore certain that the two measures in no way duplicate each other. We may also conclude that superior or inferior intelligence

may be found as frequently among the neurotic as among the emotionally well-adjusted. This is a matter of considerable administrative importance.

At a recent conference the question was raised as to whether the Personality Schedule might be used for eliminating neurotic students from colleges and universities. Even if the Personality Schedule could be given under such circumstances with assurance of getting truthful answers (and that is very doubtful), the authors would object to its use for such purposes. The fact that there is no relation between intelligence and the neurotic score indicates that poor intelligence certainly would not be eliminated by the Personality Schedule. It is possible that imaginative and creative minds may be found in the neurotic range as often as in the emotionally well-adjusted range. In the long run it might therefore be very poor policy to eliminate neurotic personalities from university education. The only reason for elimination in this direction should be emotional instability so bad that the minimum of social adjustment cannot be attained.

While there seems to be no relation between intelligence and neurotic personality, it was possible that a relation could exist between scholarship and neurotic personality. One's first guess would be, perhaps, that the neurotic students would have more difficulty in making their academic adjustments, just as they have more difficulty in making their social and emotional adjustments, but the tabulation of our data does not bear out such a guess. In Table 4 we have listed the average scholarship in grade points for each of the five letter groups as determined by the Personality Schedule. The entire freshman class was rated in five letter groups for reports to the deans. The score equivalents of these letter ratings are shown in Table 5. It will be seen that the average scholarship of the freshmen in Groups D and E, the neurotic end of the scale, is higher than that for the emotionally well-adjusted students in the A and B groups. We make the conclusion, therefore, that the neurotic students are, on the average, better students than their well-adjusted classmates. This finding may be made to look reasonable by the assumption that the neurotic student has fewer social distractions than the well-adjusted student and that he therefore concentrates more on scholastic attainment.

TABLE 4
MEAN GRADE POINTS FOR EACH OF THE FIVE GROUPS, A, B, C, D, E

Group	M	σ
A	2.73	1.06
B	2.84	1.39
C	2.72	1.34
D	3.10	1.46
E	3.03	1.27
Total	2.84	1.35

TABLE 5
LETTER RATINGS FOR THE PERSONALITY SCHEDULE

Letter rating	Personality score	Description
A	0-14	Unusually well-adjusted
B	15-44	Well adjusted
C	45-64	Average
D	65-84	Emotionally maladjusted
E	85-134	Should have psychiatric advice

QUESTIONS CONCERNING THE SUBJECT'S FAMILY

In the first experimental list of questions there were a number of items relating to the subject's family. These were scattered throughout the whole schedule, but they have been brought together for analysis in Table 6. The first column gives the identification number of the question, and it also refers to the location of the question in the first printed form. The second column shows the answers that were scored as neurotic or maladjusted. For example, the question "Is your home environment happy?" is considered to have two possible maladjusted answers. If the subject rings the answer "No," it is of course counted as a maladjusted answer. If he rings the question mark, it is also counted as a maladjusted answer, because he evidently has some doubt as to whether his home environment is really happy, or else he is avoiding an unpleasant circumstance by answering with a question mark. Either one of these two answers is therefore counted as maladjusted. The second column of Table 6 shows the other answers that were handled in a similar manner.

The actual questions are given in the table and also the number of maladjusted answers in Groups I and II respectively. For example, the question "Were your parents happily married?" has no maladjusted answers in Group I, but it has 14 maladjusted answers

TABLE 6
QUESTIONS ABOUT THE SUBJECT'S FAMILY

3a-30	(No and ?)	Were your parents happily married? (0-14)
3b-20	(Yes and ?)	Is your mother dissatisfied with her lot in life? (4-18)
2a-18	(No)	Is your mother's nature usually cheerful? (1-12)
4b-18	(No and ?)	Is your home environment happy? (1-13)
3b- 4	(Yes and ?)	Has any of your family committed suicide? (0-2)
2b-11	(No)	Did you have a happy childhood? (1-8)
3a- 7	(No and ?)	Were you happy when fourteen to eighteen years old? (2-24)
2b-14	(Yes)	Were you your parents' favorite child? (3-12)
2b- 3	(Yes and ?)	Were your parents partial to any of your brothers or sisters? (1-11)
1a-11	(No and ?)	Do you get on well with your brothers and sisters? (0-9)
3a-10	(Yes)	Have you been the scapegoat in the family life? (1-7)
4b-24	(No and ?)	Has your family always treated you right? (0-11)
1a- 4	(No and ?)	Have your relationships with your mother always been pleasant? (1-10)
2b-18	(No and ?)	Have your relationships with your father always been pleasant? (1-17)
3b-33	(Yes)	Do you love your mother more than your father? (5-16)
1b- 9	(Yes)	Do you love your father more than your mother? (1-5)
4b-32	(Yes and ?)	Do you occasionally have conflicting moods of love and hate for members of your family? (2-34)
4a-25	(Yes)	Was your mother the dominant member of the family? (3-13)
4b-14	(Not used)	Was your father the dominant member of the family? (12, 15-17, 17)

in Group II. There were 50 students in each of these two groups. These two facts are represented by the notation (0-14) after the question. The frequencies of maladjusted answers in the two groups are represented in a similar manner after each of the other questions.

It is to be noted that all except the last question are differentiating and internally consistent. In all except the last one of the questions in this list concerning the subject's family, there are many more maladjusted answers in the neurotic Group II than in the emotionally well-adjusted Group I. The differences are rather striking for many of the questions. The last question is not differentiating. The notation (12, 15—17, 17) means that in Group I there were 12 answers "Yes," 15 answers "No," and that in Group II there were 17 answers "Yes," and 17 answers "No." A comparison of the last two questions seems to indicate that it is an unfavorable circumstance

in the development of the child's personality for the mother to be the dominant member of the family. This question was therefore retained in the final edition, but the last question was omitted because it does not differentiate between the two groups.

The interpretation of these family characteristics in relation to the child's personality is not easy. It may be that the family situations represented by these questions constitute an unfavorable social environment for the development of the child's personality and that even a healthy child would become neurotic as a result of a socially unfavorable home environment. It is also possible that the explanation is constitutional. If one or both of the parents are emotionally unstable and neurotic, it might seem reasonable to expect that one or more of the children will also develop the same defect. The most plausible explanation is probably that a neurotic or emotionally unstable constitution of one or both of the parents is inherited by the child. The unfavorable home environment is a handicap which the healthy child overcomes, while the child of neurotic parents who are unhappily married does not succeed in overcoming the double handicap of an unstable constitution and an unfavorable home environment.

QUESTIONS CONCERNING THE SUBJECT'S SEX LIFE

In Table 7 we have summarized the questions that concern the subject's sex life. It will be noticed that all of these questions are

TABLE 7
QUESTIONS RELATING TO THE SUBJECT'S SEX LIFE

4a- 5	(Yes)	Are you shy with boys? (0-23)
4a- 6	(Yes)	Are you shy with girls? (0-21)
2b-38	(Yes)	Do you limit your friendships mostly to your own sex? (5-26)
4b-33	(Yes)	Are you generally regarded as indifferent to the opposite sex? (2-26)
3a-36	(Yes)	Would you say that you are cynical about members of the opposite sex generally? (0-26)
3b- 8	(Yes)	Is there a conflict in your nature between sex and morality? (1-24)
1b-18	(Yes)	Are you easily shocked by sexual topics, <i>risqué</i> stories, and the like? (2-12)
3a-33	(Yes)	Would you say that you are more or less ignorant of sex? (2-12)
2b- 2	(Yes)	Have you ever been afraid that you are sexually inferior to other men (other women)? (1-21)
3a-39	(Yes)	Do you find it difficult to pass urine in the presence of others? (1-18)

differentiating. These questions about sex may be summarized by the generalization that the neurotic personality has few friends of the opposite sex and is defensive about it. This generalization seems clear, because in practically every one of these questions there are hardly any maladjusted answers among the 50 students in Group I, while about half of the neurotic group answer every question in the maladjusted manner. The overcoming of shyness with the opposite sex might be a very important step in the development of normal personality adjustment.

QUESTIONS ABOUT ORDER OF BIRTH

We had four questions about birth order in the entire schedule. These questions were inserted for the purpose of checking some current theories about the relation of birth order to personality development. Alfred Adler has tried to attach some special importance to birth order in the explanation of personality maladjustment of children. Since we had no preconceived ideas about what this relation might be, we could not assign any definite neurotic answers to these questions. We have therefore listed for each question in Table 8 both the "Yes" and "No" answers. For example, the first question "Did you grow up as an only child?" has 8 "Yes" answers and 41 "No" answers in the best-adjusted group (Group I), and 11 "Yes" answers and 39 "No" answers in the neurotic group (Group II). These facts are summarized in Table 8 by the notation

TABLE 8
QUESTIONS ABOUT ORDER OF BIRTH

3a-38	Did you grow up as an only child? (8, 41-11, 39)
4a-28	Did you grow up as the youngest child? (24, 24-16, 25)
3a-24	Did you grow up as the oldest child? (20, 28-20, 25)
4b- 5	Did you grow up as the next to the oldest child? (7, 39-11, 30)

(8, 41—11, 39). The differences between 8 and 11 "Yes" answers and between 41 and 39 "No" answers are not large enough to be valid. Similar analysis of the "Yes" and "No" answers to the other questions about birth order gives the same result. We conclude, therefore, that the order of birth is not demonstrated to have any important relation to the development of a maladjusted or neurotic personality. This does not mean that being an only child, youngest child, oldest child, and so on, might not be an important contribu-

tory factor in the development of a neurotic personality. But our data do indicate that the question of birth order is not so universally important a consideration in mental hygiene as is sometimes believed.

PSYCHOLOGICAL INTERPRETATION OF THE NEUROTIC PERSONALITY

The last two columns of Table 1 were examined in order to make a list of those particular questions which most strikingly differentiate Groups I and II. For the reader's convenience these questions that best differentiate the two groups are summarized separately in Table 9. In reading these questions one gets the impression that there is a common psychological trait which is represented in all of them.

TABLE 9

LIST OF MOST DIFFERENTIATING QUESTIONS IN THE PERSONALITY SCHEDULE

1a- 3	Do you get stage fright? (5-35)
1a-17	Do you have difficulty in starting a conversation with a stranger? (3-30)
1b- 2	Do you worry too long over humiliating experiences? (1-40)
1b- 8	Do you often feel lonesome, even when you are with other people? (1-42)
1b-10	Do you consider yourself a rather nervous person? (0-32)
1b-17	Are your feelings easily hurt? (2-37)
1b-19	Do you keep in the background on social occasions? (0-32)
2a- 1	Do ideas often run through your head so that you cannot sleep? (4-42)
2a-12	Are you frequently burdened by a sense of remorse? (0-39)
2a-21	Do you worry over possible misfortunes? (2-37)
2a-27	Do your feelings alternate between happiness and sadness without apparent reason? (5-41)
2a-33	Are you troubled with shyness? (0-33)
2b-10	Do you day-dream frequently? (3-40)
2b-15	Have you ever had spells of dizziness? (2-31)
2b-16	Do you get discouraged easily? (0-38)
2b-22	Do your interests change quickly? (2-33)
2b-29	Are you easily moved to tears? (1-33)
2b-37	Does it bother you to have people watch you at work even when you do it well? (5-40)
2b-41	Can you stand criticism without feeling hurt? (0-25)
2b-42	Do you have difficulty in making friends? (0-25)
3a- 1	Are you troubled with the idea that people are watching you on the street? (2-30)
3a-12	Does your mind often wander badly so that you lose track of what you are doing? (0-32)
3a-32	Have you ever been depressed because of low marks in school? (2-30)
3a-35	Are you touchy on various subjects? (1-31)
3b- 7	Are you often in a state of excitement? (0-33)
3b-10	Do you frequently feel grouchy? (0-30)
3b-17	Do you feel self-conscious when you recite in class? (2-36)

- 3b-25 Do you often feel just miserable? (0-40)
- 3b-27 Does some particular useless thought keep coming into your mind to bother you? (0-35)
- 3b-36 Do you hesitate to volunteer in a class recitation? (1-29)
- 4a- 2 Are you frequently in low spirits? (0-30)
- 4a-11 Do you often experience periods of loneliness? (1-39)
- 4a-16 Do you often feel self-conscious in the presence of superiors? (4-45)
- 4a-19 Do you lack self-confidence? (1-35)
- 4a-23 Do you find it difficult to speak in public? (3-36)
- 4a-33 Do you often feel self-conscious because of your personal appearance? (5-39)
- 4a-34 If you see an accident are you quick to take an active part in giving help? (3-26)
- 4a-35 Do you feel you must do a thing over several times before you leave it? (3-29)
- 4b- 4 Are you troubled with feelings of inferiority? (0-36)
- 4b- 6 Do you often find that you cannot make up your mind until the time for action has passed? (0-35)
- 4b-10 Do you have ups and downs in mood without apparent cause? (1-38)
- 4b-30 Are you in general self-confident about your abilities? (0-31)
-

The writers suggest that *the fundamental characteristic of the neurotic personality is an imagination that fails to express itself effectively on external social reality*. All of the questions in Table 9 can be read with this idea as a unifying principle. The biological function of imagination is here regarded as preparation for action, and imagination itself may be regarded as unfinished action. Its natural course is to complete itself in overt action. The neurotic personality is one which fails somehow in the relation between imagination and external social reality. All of the most differentiating questions can be interpreted as special cases of this principle.

If imagination fails to express itself effectively on external social reality, it is only natural to expect that the social expressions of the personality will be inhibited. Examples are the following questions.

Do you have difficulty in starting conversation with a stranger?

Do you keep in the background on social occasions?

Are you troubled with shyness?

If you see an accident are you quick to take an active part in giving help?

Do you often find that you cannot make up your mind until the time for action has passed?

It is only natural to expect a picture of mental hyper-activity, since imagination does not naturally and spontaneously express itself. Examples of this effect are the following:

Are you often in a state of excitement?

Does your mind often wander badly so that you lose track of what you are doing?

Do ideas often run through your head so that you cannot sleep?

One should also expect that this picture of mental activity, which is inhibited in expression, should lead to excessive worry about the self. Examples are the following.

Do you worry too long over humiliating experiences?

Are your feelings easily hurt?

Are you frequently burdened by a sense of remorse?

Are you troubled with the idea that people are watching you on the street?

A personality of this inhibited sort could hardly be expected to have self-confidence in social relations. The same lack of rapport between imagination and social reality makes the subject vacillating in mood. He is on top of the world when imagination is free, and he is down when the lack of rapport between imagination and reality is too painfully in evidence. Examples are the following.

Do your feelings alternate between happiness and sadness without apparent reason?

Do your interests change quickly?

Do you have ups and downs in mood without apparent cause?

We seem to be able to unify the most differentiating questions, which are summarized in Table 9, by the generalization that the neurotic person is one whose imagination somehow fails to express itself effectively on social reality. In extreme cases his ineffective adjustments take bizarre forms as in the conversion hysterics. It seems to the writers that the less serious forms of neurotic maladjustment have the characteristics ordinarily known as introversion. In fact, many of the differentiating questions are those frequently used for the description of introversion. In the more serious forms of emotional maladjustment the subject either gives up in his attempt to adjust or he makes erratic and conspicuously ineffective attempts to gain his social ends. In the degrees of emotional maladjustment with which we are dealing in a large freshman class of 700 students, the unifying trait seems to be the inability to express imagination socially.

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INVENTAIRE DES NÉVROSÉS

(Résumé)

Cet inventaire de personnalité se compose d'une liste de 225 questions, prises pour la plupart dans les plus courtes listes d'autres auteurs, y compris Woodworth, House, Laird, et Allport. Le sujet répond à chaque question en marquant une des trois réponses "oui," "non," ou "?." Le but est d'obtenir une indication d'un mauvais ajustement émotionnel. L'analyse statistique des questions montre un même trait dans toutes les questions de sorte que l'évaluation se trouve constante. La constance de cette évaluation déterminée chez un groupe de 700 étudiants universitaires est de 0,95. On a trouvé que les femmes ont répondu en moyenne à plus de questions d'une manière névrosique que les hommes; que les étudiants faisant partie des clubs et des fraternités donnent en moyenne peu de réponses montrant un mauvais ajustement; et qu'il n'y aura nulle différence significative à cet égard entre les juifs et les gentils. L'évaluation de cette liste donne une corrélation de zéro avec l'intelligence. Il semble qu'il n'y ait nul rapport à constater entre le nombre de réponses montrant un mauvais ajustement du sujet et l'ordre de naissance de celui-ci. La différence entre les étudiants d'un bon ajustement émotionnel et ceux d'un mauvais ajustement semble la plus frappante dans les questions où il s'agit de la vie sexuelle. On a trouvé un meilleur rendement scolaire chez les étudiants d'un mauvais ajustement émotionnel que chez ceux d'un bon ajustement, si on le détermine par les résultats de cette liste. Si on peut appeler le même trait trouvé dans toutes ces 225 questions le caractère de névrosé, l'analyse des questions nous donne donc l'hypothèse que la personnalité névrosée est celle dont l'imagination ne s'exprime pas effectivement dans la réalité extérieure sociale.

L. L. THURSTONE ET T. G. THURSTONE

ÜBER EIN NEUROTISCHES INVENTAR

(Referat)

Dieses Persönlichkeits-Inventar besteht aus einer Liste von 225 Fragen, die grösstenteils kürzern Listen anderer Verfasser entnommen sind, unter diesen auch Woodworth, House, Laird, und Allport. Jede Frage beantwortet

die Vp. durch unterstreichen einer der drei Antworten, *ja, nein, oder?* Der Zweck dieser Studie ist ein Verzeichnis zum Ermessen der gemütlichen Unzulänglichkeit zu erhalten. Die statistische Analyse der Fragen ergibt dass alle gemeinsam denselben Kern enthalten, und dass daher die Leistungswerte sich als konsequent erweisen. Die Zuverlässigkeit dieser Leistungswerte an einer Gruppe von 700 Universitäts Studenten geprüft, war .95. Man fand dass Frauen durchschnittlich mehr Fragen in neurotischer Weise beantworten als Männer; dass Studenten, die zu Vereinen oder Bruderschaften gehören durchschnittlich seltener unzulängliche Antworten geben; und dass es in dieser Beziehung wahrscheinlich keinen Unterschied zwischen Juden und Christen gibt. Die Leistungswertung dieses Inventars korreliert null mit Intelligenz. Es scheint keine merkliche Beziehung zwischen der Anzahl der gemütlich unzulänglichen Antworten der Vp. und der Geburtsordnung zu bestehen. Der Unterschied zwischen den gemütlich normalen und anormalen Studenten zeigte sich am auffallendsten bei den Fragen die sich auf das Geschlechtsleben beziehen. Nach den Leistungswerten des Inventars zu urteilen, scheinen die anormalen Studenten etwas besser unterrichtet als die normalen. Darf man den charakteristischen Zug der allen diesen Fragen eigen ist als "neurotisch" bezeichnen, so führt eine Analyse der Fragen zu der Hypothese dass im neurotischen Menschen die Einbildungskraft in der äusserlichen sozialen Wirklichkeit nicht wirkungsvoll zum Ausdruck gelangt.

L. L. THURSTONE UND T. G. THURSTONE

THE DEVELOPMENT OF MEN OF SCIENCE*

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The forces that foster the growth of scientific men and that lead to eminence in scientific performance have been shrouded largely in the age-old question as to whether environment or heredity is the determining factor. Cattell (2) in his studies of American men of science raised more specific questions as to the influence of such factors as place of birth, institution where undergraduate or graduate work was done, age at which undergraduate or graduate work was completed, occupation of parents, etc.; and Brimhall (1) studied further the incidence of scientific activity among the relatives of scientific men.

The material used in the studies of Cattell and Brimhall consisted of the biographical data appearing in *American Men of Science*, (2) for the group of persons who had stars attached to their names, indicating their inclusion among the 1000 leading men of science in America. These 1000 leading men were apportioned among the 12 sciences according to the total number of men in each science as shown in the first column of figures below.

	1906	1927
Psychology	50	73
Mathematics	80	124
Pathology	60	63
Zoölogy	150	204
Physiology	40	85
Anthropology	20	25
Botany	100	128
Chemistry	175	227
Physics	150	204
Astronomy	50	62
Geology	100	
Anatomy	25	

Their place in this group was based on the judgment of 10 leading

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men in each of the scientific groups. The meaning to be attached to such a classification is clearly indicated in the following quotation from Cattell:

"It should be distinctly noted that the figures give only what they profess to give, namely, the resultant opinion of 10 competent judges. They show the reputation of the men among experts, but not necessarily their ability or performance. Constant errors, such as may arise from a man's being better or less known than he deserves, are not eliminated. There is, however, no other criterion of a man's work than the estimation in which it is held by those most competent to judge I am somewhat skeptical as to merit not represented by performance or as to performance unrecognized by the best contemporary judgment. There are doubtless individual exceptions, but, by and large, men do what they are able to do and find their proper level in the estimation of their colleagues" (2, 2nd ed., p. 540).

Many interesting facts were disclosed through an examination of the biographical data of these 1000 men. Especially suggestive was the comparison of the first 500 with the second 500 of the 1000 men, which showed, among other things, that the former obtained their undergraduate and graduate degrees at an appreciably earlier age than the latter.

These findings inspired the present study which is a comparison of a portion of the starred group in the 1927 edition of *American Men of Science*, comprising 10 sciences (with 1195 members) as shown in second column of figures, page 31, and a sampling of the non-starred group, including 1101 members. This sampling was obtained by taking the first non-starred biography on each page of the directory. In making such a comparison, two facts should be kept in mind. First, "the probable error at the end of the list is about 100 places, so there are 100 others who have at least 1 chance in 4 of belonging to this group" (2, 2nd ed., p. 544). And, secondly, there are those in the unstarred group who will certainly receive stars at a later age. There will be probably somewhat less than 10% of our non-starred group misplaced for this reason. Hence there will be in the neighborhood of 15% of the non-starred who might have been or might at some time be starred. The influence of these factors will be to reduce the size of whatever differences may be found between the two groups.

The biographical data in the directory afforded material for the following comparisons of the starred and non-starred groups:

- 1) Birth place (state)
- 2) Size of birthplace (city)
- 3) Undergraduate college
- 4) Graduate school
- 5) Shifts in occupation
- 6) Age at which degrees were conferred
- 7) Age at which name appeared in the *American Men of Science*.
- 8) Present position

1) *Birthplace*. Our justification for examining such factors as (1) and (2) is well expressed in the following quotation: "From a conventional point of view the distribution of men of science would not be regarded as a psychological problem perhaps not even as a scientific problem. But in recent years the distribution of plants and animals has received increasing attention in botany and zoölogy, and, apart from its pertinence as a correct description of the world in which we live, it has proved, on the one hand, to have certain practical applications, and, on the other hand, to throw light on certain general problems of heredity and evolution. Similar results may accrue from a scientific study of the distribution of human ability and performance" (2, 2nd ed., p. 552).

The distribution among the large divisions of the United States is presented in Table 1. Both the starred and non-starred groups are seen to be very unevenly distributed, the South Atlantic, South Central, and the Pacific sections having a relatively small proportion of scientific men. As the populations of these sections differ considerably, one can get a true picture of the situation only by finding the number per million of the population. These data, based on the census figures for 1910 are given in Columns 3 and 6. The differences now appear to be less than before population was taken into account, although the discrepancies are large. Thus, whereas before population was considered, the most productive section had 10 times as many non-starred and 19 times as many starred as the least productive, when population is considered the figures become 6 for the non-starred, and 11 for the starred. The last column in the table shows the relation of starred to non-starred in the different sections. Even here we find that the ratio of starred to non-starred is twice as great for the most productive as contrasted with the least productive. The percentage of foreign born in the two groups is practically the same, being 12.1 for the non-starred and 13.6 for the starred.

TABLE 1

DISTRIBUTION OF STARRED AND NON-STARRED MEN ACCORDING TO BIRTHPLACE

Section	Non-starred			Starred			Non-starred
	No. in sample	Per-centage	No. in total group* per 1,000,000 pop.‡	No. in sample	Per-centage	No. in total group† per 1,000,000 pop.‡	
North Atlantic	371	33.7	162.0	474	39.6	23.3	.14
South Atlantic	82	7.5	93.0	79	6.6	10.1	.11
North Central	426	38.6	159.0	420	35.1	17.6	.11
South Central	44	4.0	29.0	30	2.5	2.1	.07
Pacific	41	3.7	65.0	28	2.1	5.0	.08
Foreign	137	12.1		163	13.6		
Total	1101			1195			

*12,000.

†1500.

‡According to the census of 1910.

The changes in the distribution of the starred men over a period of approximately 25 years may be seen in Table 2. The figures are expressed in terms of percentage and may be compared directly in spite of the difference in the total number of cases. It should be noted that for 1903 all 12 sciences are represented, while for 1927 only the 10 sciences mentioned above are represented. The writer feels sure that the changes noted over the 25-year period are real differences and are not due to the absence of the two science groups. The most striking facts in this table are the large loss of the North Atlantic states, and the large gain of the North Central states. The North Atlantic is the only section that lost, although the gains of the South Atlantic, South Central, and Pacific are slight. These changes are undoubtedly due to certain significant shifts in the character of the population of these sections of the country. Table 2 furnishes the opportunity for a more detailed comparison of these changes, state by state. For instance, the greatest absolute losses occurred in Massachusetts and New York, and the greatest absolute gains occurred in Illinois, Indiana, and Iowa.

2) *Size of Birthplace.* In Table 3 the two groups are compared as to the population of their birthplaces. The population is that of the census nearest to the birthdate. The only comparison that can be made safely in this table is between the two groups for a given size of birthplace, since we cannot tell what proportion of the population was living in the communities of the various sizes. No significant

TABLE 2
DISTRIBUTION OF STARRED MEN ACCORDING TO BIRTHPLACE

Section and state	1903	1927
North Atlantic		
Maine	2.9	1.8
New Hampshire	1.5	1.4
Vermont	1.8	1.3
Massachusetts	13.5	9.7
Rhode Island	0.5	0.5
Connecticut	4.0	3.3
New York	18.5	12.3
New Jersey	2.8	2.6
Pennsylvania	6.6	6.8
Total	52.1	39.7
South Atlantic		
Delaware	0.2	0.1
Maryland	2.6	2.3
District of Columbia	0.3	0.3
Virginia	1.3	1.9
West Virginia	0.1	0.3
North Carolina	0.5	0.9
South Carolina	0.5	0.3
Georgia	0.3	0.3
Florida	..	..
Total	5.8	6.4
South Central		
Kentucky	0.8	0.8
Tennessee	0.6	0.9
Alabama	0.2	0.4
Mississippi	0.1	0.1
Arkansas	..	0.1
Louisiana	0.1	0.1
Oklahoma	..	0.1
Texas	0.3	0.4
Total	2.1	2.9
North Central		
Ohio	7.6	7.8
Indiana	2.8	4.4
Illinois	4.2	5.9
Michigan	2.7	3.5
Wisconsin	3.5	4.5
Minnesota	0.4	1.3
Iowa	2.0	3.5
Missouri	1.4	2.3
North Dakota	..	0.1

TABLE 2 (cont.)
DISTRIBUTION OF STARRED MEN ACCORDING TO BIRTHPLACE

Section and state	1903	1927
South Dakota	..	0.1
Nebraska	0.2	0.1
Kansas	0.7	1.4
Total	25.5	34.9
Pacific		
Montana	..	0.1
Idaho	..	..
Utah	..	0.3
Wyoming	..	0.2
Nevada	..	..
Colorado	0.3	0.2
New Mexico	..	..
Arizona	..	..
Washington	0.1	0.1
California	1.1	1.4
Total	1.5	2.3
Foreign	12.7	13.6
Total	993	1195

differences appear which would enable us to conclude, e.g., that small towns are more likely than large to foster the production of eminent scientific men.

3) *Undergraduate College.* The number of undergraduate colleges from which the scientific men in both groups received their degrees is surprisingly large. For the non-starred group there were

TABLE 3
DISTRIBUTION OF STARRED AND NON-STARRED MEN ACCORDING TO SIZE* OF BIRTHPLACE

Population	Non-starred		Starred	
	No.	Percentage	No.	Percentage
Under 1000	232	21.1	241	20.2
1000 to 5000	234	21.3	273	22.9
5000 to 10,000	85	7.7	85	7.1
10,000 to 25,000	79	7.2	100	8.4
25,000 to 100,000	81	7.4	84	7.0
Over 100,000	189	17.2	183	15.3
Canada	49	4.2	43	3.6
Foreign	87	7.9	120	10.0
Unknown	65	5.8	66	5.5
Total	1101		1195	

*Census nearest to birthdate.

230 institutions, and for the starred, 187 institutions, or 1 for every 5 men in the former, and 1 for every 6 in the latter. The distribution of degrees was so scattered that any detailed report of them would be out of the question, although those institutions granting 1% or more of the degrees are listed in later tables. From Table 4 we see that 33.6% of all the degrees of the non-starred group come from institutions conferring less than .5% of them, whereas for the starred group the corresponding figure is 26.0%. Also, institutions conferring 1% or more of the degrees show 48.2% for the non-starred, and 54.1% for the starred. Thus, there is a tendency for the starred men to obtain their degrees from relatively fewer institutions, and slightly more of them obtain their degrees from foreign institutions. This latter difference, however, is small.

TABLE 4
UNDERGRADUATE DEGREES

Degrees	Non-starred	Starred
Total degrees	1101	1195
Known degrees	1024	1151
No. from institutions with less than .5%	344 (33.6)	299 (26.0)
No. from institutions with less than 1%	476 (46.5)	451 (39.2)
No. from institutions with 1% or more than 1%	494 (48.2)	623 (54.1)
Foreign	54 (5.3)	77 (6.7)

Table 5 gives the distribution in terms of the institutions giving 1% or more of the undergraduate degrees to the non-starred and to the starred groups. It appears that a number of institutions, as, for instance, Harvard, Columbia, Johns Hopkins, and Yale, grant undergraduate degrees to a larger percentage of the starred than the non-starred, while most other institutions grant fewer degrees.

The changes which have taken place in approximately 25 years, as far as the education of the starred scientific men is concerned, may be seen in Table 6. The first two columns give the records for undergraduate degrees. The most striking change is in the increase in the number of institutions involved. Whereas in the 1903 group 99% obtained their undergraduate degrees from institutions granting 1% or more of the degrees, the corresponding figure for the 1927 group is only 54.1. In the earlier period, two institutions, Harvard and Yale, granted 30.7% of the undergraduate degrees to our emi-

TABLE 5
UNDERGRADUATE DEGREES: INSTITUTIONS WITH 1% OR MORE

Institution	Percentage non-starred	Percentage starred
Amherst	..	1.6
Brown	1.2	1.1
California	1.9	2.2
Chicago	2.2	1.8
College of the City of New York	1.0	1.1
Columbia	1.3	3.6
Cornell	3.5	3.0
Harvard	4.0	9.0
Illinois	2.1	..
Indiana	2.3	2.2
Iowa	1.3	..
Johns Hopkins	1.8	2.7
Kansas	1.7	1.3
Massachusetts College	1.3	..
Massachusetts Institute of Technology	2.5	3.5
Michigan	3.2	3.3
Minnesota	1.4	1.4
Missouri	1.3	..
Nebraska	1.8	1.3
North Carolina	1.0	..
Ohio State	1.9	1.5
University of Pennsylvania	1.7	1.8
Princeton	..	2.1
Stanford	1.7	1.6
Wesleyan	..	1.8
Williams	..	1.2
Wisconsin	3.9	2.1
Yale	2.3	4.2

nent scientific group, while in the later period the same institutions granted only 13.2%. These changes become even more striking when it is recalled that a certain proportion of the men are the same in the 1903 and the 1927 lists. Although a new starred group was determined in 1927, no one who had been given a star in the earlier study was deprived of it, even though he did not retain his position in the later study.

4) *Graduate School.* Similar computations have been made for the graduate degrees. Difficulty arose in preparing these tables in connection with the M.D. degree. Frequently it was uncertain whether to consider the degree as equivalent to a graduate or an undergraduate degree. Also, a given individual might receive more than one degree from the same institution, as, for example, the A.M.

TABLE 6

DISTRIBUTION OF STARRED MEN 1903-1927
INSTITUTIONS WITH 1% OR MORE DEGREES

Institution	Undergraduate		Graduate	
	1903	1927	1903*	1927†
Amherst	4.5	1.6	..	..
Brown	1.5	1.1	..	..
California	2.3	2.2	..	..
Chicago	..	1.8	4.7	8.4
Clark	..	..	2.5	1.8
College of the City of New York	2.1	1.1	..	..
Columbia	5.4	3.6	7.8	6.7
Cornell	6.0	3.0	5.3	3.5
Dartmouth	1.9	..	..	..
George Washington	1.0	..	..	..
Harvard	20.6	9.0	11.7	11.7
Indiana	1.5	2.2	..	1.7
Iowa	1.2	..	..	..
Johns Hopkins	5.2	2.7	21.0	9.2
Kansas	..	1.3	..	1.3
Massachusetts Institute of Technology	5.1	3.5	..	..
Michigan	6.8	3.3	2.3	2.0
Minnesota	..	1.4	..	1.3
Nebraska	1.9	1.3	..	1.3
Oberlin	1.9	..	..	..
Ohio State	..	1.5	..	..
University of Pennsylvania	2.9	1.8	1.8	2.5
Princeton	4.5	2.1	..	2.4
Stanford	..	1.6	..	..
Wesleyan	3.1	1.8	..	..
Williams	2.7	1.2	..	..
Wisconsin	2.7	2.1	..	1.5
Yale	10.1	4.2	5.8	4.0
Foreign	4.5	6.7	31.0	16.8
Percentage of degrees in above institutions	99.0	54.1	96.0	60.9
Total degrees	515	1151	487	1490

*Ph.D. only.

†Highest earned degree.

and Ph.D. Only the highest graduate degree received from any one institution was counted.

In Table 7 the principal findings concerning the distribution of graduate degrees for the non-starred and the starred groups are presented. Three times as large a proportion of the starred group receive degrees from foreign institutions as of the non-starred group. The number from institutions granting 1% or more of the degrees is

not very different for the two groups, although there are more non-starred than starred men who receive their degrees from institutions granting less than .5% of the degrees. The total number of institutions attended by the non-starred group is 148, or about 1 for every 8 men, while the figures for the starred group are 117 and 10. Table 8 gives the data for the institutions granting 1% or more of the graduate degrees. Here Harvard, Chicago, Johns Hopkins, and Princeton grant a larger proportion of the degrees to the starred than to the non-starred men.

TABLE 7
GRADUATE DEGREES

Degrees	Non-starred	Starred
Total degrees*	1152	1490
Known degrees	1152	1275
No. from institutions with less than .5%	260 (22.6)	186 (14.6)
No. from institutions with less than 1%	302 (26.2)	284 (22.3)
No. from institutions with 1% or more than 1%	788 (68.4)	777 (60.9)
Foreign	62 (5.4)	214 (16.8)

*Only highest graduate degree from any one institution.

TABLE 8
GRADUATE DEGREES INSTITUTIONS WITH 1% OR MORE

Institution	Percentage Non-starred	Percentage starred
California	2.3	1.6
Chicago	6.2	8.4
Clark	1.2	1.8
Columbia	6.5	6.7
Cornell	6.2	3.5
Harvard	8.1	11.7
Illinois	4.1	..
Indiana	1.5	1.7
Iowa	2.0	..
Johns Hopkins	7.3	9.2
Kansas	1.3	1.3
Michigan	2.9	2.0
Minnesota	1.9	1.3
Nebraska	1.4	1.3
Ohio State	1.6	..
University of Pennsylvania	2.5	2.5
Princeton	1.1	2.4
Stanford	1.4	..
Wisconsin	5.2	1.5
Yale	3.7	4.0

By referring again to Table 6, the changes for the starred group over a period of approximately 25 years may be noted. Whereas, in 1903, 96% of the degrees were granted by institutions giving 1% or more, in 1927 the figure is reduced to 60.9. That is, many more institutions are granting graduate degrees today. There is a reduction of nearly 50% in the number of foreign degrees conferred. For the 1903 group, Johns Hopkins conferred over $\frac{1}{5}$ of all the degrees, while for the 1927 group it conferred slightly less than 10%. Harvard has held exactly the same rate for the two periods. The most notable increase is in the case of the University of Chicago, whose percentage increased from 4.7 to 8.4.

5) *Shifts of Occupation.* It occurred to the writer that the two groups (non-starred and starred) might differ in the date of discovery of their interest and in the stability with which this interest manifested itself in positions held. The data in the directory afforded a comparison of first and present positions, especially as to whether the line of work was the same or different. If, upon graduating from college, one became an assistant in a biological laboratory, and his present position were Professor of Biology, that would indicate a high degree of stability. But if the first position were assistant in biology, and the present position were Professor of Psychology, that would indicate a shift of interest. The former was rather arbitrarily considered as absence of shifting, and the latter as shifting of interest, although it is conceivable that the situation might be reversed as far as inherent interest is concerned. For the purposes of this study, objective evidence of shifting among the major divisions of science was alone considered. Table 9 gives the results of a comparison of the non-starred and the starred groups. The differences are negligible, although the starred group showed slightly more shifting. Fewer of the starred group began their careers in secondary school work, as indicated by the percentages of 8.7 and 6.4. At the most, this difference would be merely suggestive, as our measures of shifting were so crude.

TABLE 9
STABILITY OF OCCUPATION

	Unstarred	Percentage	Starred	Percentage
Total no. cases in sample	1101		1195	
No. who changed	149	13.5	183	15.3
No. changing from secondary schools	96	8.7	77	6.4

6) *Age at Which Degrees Were Conferred.* One of the most interesting findings of Cattell in his study of the 1000 men of science concerned the age difference between the first and second 500 of his group. The former received their academic degrees at an earlier age than the latter. Similar computations have been made for our samplings of the non-starred and starred groups as to age at which undergraduate degrees, and the degrees of Ph.D. and M.D. were conferred. These age distributions appear in Table 10. The range of ages is almost exactly the same for the two groups for the various degrees, although in every case the median age is younger for the starred than for the non-starred group. For the undergraduate degrees there is a difference of .8 of a year, for the Ph.D., 1.3 years, and for the M.D., a difference of .9 of a year. These differences would almost certainly be increased if the composition of the two groups were distinct (see page 32). There were certain interesting differences in the age at which degrees were conferred in the different sciences, although space does not permit a report of the data here. As far as the Ph.D. is concerned, the mathematicians seemed to get this degree earlier than the other scientific groups.

7) *Age at Which Name Appeared in the Directory.* At what age was an individual's scientific standing sufficient to warrant the inclusion of his name in the Directory, and does this age differ for the starred and the non-starred groups? Appearance in the Directory depends mainly upon membership in some one or more of the scientific societies. And most, if not all, of these societies limit their membership to those actively engaged in the science. Hence, the age at which an individual's name appears in the Directory gives a hint as to the age at which he reached a certain standing in his science.

Four editions of the Directory have been published on the following dates, 1906, 1910, 1922, and 1927. Each person in our two groups was followed back through the different editions, and the one in which his name first appeared was noted. A first appearance in the first edition was not included in our data; inasmuch as appearance therein would indicate merely that one was well enough known to be included, but he might have been included also in an earlier edition if there had been one. However, all who appeared in the second edition for the first time would be there presumably because of the standing attained since the publication of the first edition. We have, therefore, an admittedly crude measure, namely, appearance in the

TABLE 10
AGE AT WHICH DEGREE WAS CONFERRED

Age	Undergraduate degrees		Ph.D.		M.D.	
	Non-starred	Starred	Non-starred	Starred	Non-starred	Starred
(Percentages)						
17 or less	0.6	1.1				
18	1.0	1.7		0.1		
19	2.7	7.2		0.1		1.5
20	7.7	13.2	0.2	0.1	0.7	2.2
21	17.5	22.0	0.2	0.5	6.0	5.2
22	20.3	18.7	0.2	3.0	7.5	7.4
23	16.0	12.5	2.5	6.5	7.5	11.8
24	9.5	8.4	3.9	8.1	17.0	21.5
25	6.3	6.7	8.8	13.0	12.6	15.6
26	4.6	2.2	10.0	10.8	19.3	11.1
27	3.9	2.6	9.8	12.7	14.8	9.6
28	2.8	1.1	7.7	7.9	4.4	3.7
29	2.2	0.6	7.7	9.3	1.5	3.7
30	1.6	0.3	7.0	5.2	1.5	0.7
31	0.7	0.3	6.8	4.4	0.7	0.0
32	0.8	0.5	5.2	3.9	0.0	0.7
33	0.5	0.3	5.0	2.6	0.0	0.7
34	0.1	0.1	5.2	2.3	0.0	0.7
35	0.2	0.0	3.8	2.4	2.2	1.5
36	0.2	0.2	2.7	1.7	0.7	0.7
37	0.3	0.0	2.0	1.2	0.0	0.0
38	0.1	0.0	2.0	0.9	1.5	0.0
39	0.2	0.1	1.6	0.2	0.0	0.0
40	0.0	0.1	1.3	1.0	2.2	0.7
41	0.0	0.1	1.3	0.2	0.0	0.0
42	0.1	0.0	1.1	0.4	0.0	0.7
43		0.1	1.3	0.2	0.0	0.7
44			0.7	0.1		
45			0.7	0.2		
46			0.4	0.0		
47			0.4	0.2		
48			0.2	0.6		
49			0.0	0.2		
50 or more			0.4	0.2		
Median	23.1	22.3	28.9	27.6	25.9	25.0
Total	969	1046	557	825	135	135

second, third, or fourth edition. The data from the study are given in Table 11 for 7 of the sciences only, as follows: mathematics, pathology, psychology, physics, astronomy, botany, and chemistry. Although the range of ages is the same for the two groups, the median age for the starred group is about two years less than for the non-starred. Moreover, in the non-starred group there were approximately

10% who were chosen for the Directory *before* the age of 30 years, while in the starred group 17% were chosen *before* that age. We have, therefore, in all the calculations where age is involved an earlier age for the starred than for the non-starred group.

8) *Present Position.* It may be of some interest to note the present position of the members of our samples of the non-starred and starred men of science. These have been classified as shown in Table 12. It is difficult, if not impossible, to make a rigid classi-

TABLE 11
AGE AT WHICH NAME APPEARED IN DIRECTORY
(EXCLUDING FIRST, OR 1906 EDITION)

Age	Non-starred		Starred	
	No.	Percentage	No.	Percentage
22	0	0	1	0.3
24	3	.3	8	2.5
26	30	3.3	14	4.3
28	58	6.4	31	9.6
30	83	9.2	32	9.9
32	97	10.6	45	13.9
34	110	12.1	40	12.4
36	101	11.1	45	13.9
38	84	9.2	26	8.1
40	51	5.6	28	8.7
42	40	4.4	14	4.3
44	61	6.7	14	4.3
46	43	4.7	6	1.8
48	36	3.9	5	1.6
50	22	2.4	5	1.6
52	15	1.6	1	0.3
54	19	2.1	2	0.6
56	14	1.5	2	0.6
58	10	1.1	2	0.6
60	8	0.9	0	0
62	11	1.2	0	0
64	1	0.1	0	0
66	3			
68	1			
70	4	0.4	1	0.3
72	2	0.2		
74	1	0.1		
Total	908		323	
Median	37.4		35.5	
Percentage chosen under 30	10	17		

*Seven scientific groups only.

fication, and much depended upon the judgment and information of the investigator as to which class should receive a given case. The greatest difficulty was experienced in sharply distinguishing the research institutions from industry, government, and the universities. Keeping in mind the roughness of the classification, we find that the research institutions get 4 times as great a proportion of starred as unstarred men, that the universities have about 10% more starred than unstarred, and that government and industry each have about half as many starred as unstarred. Difficulties of classification made it necessary to include a miscellaneous and an unknown group comprising 11% of the non-starred and 8.4% of the starred.

TABLE 12
DISTRIBUTION ACCORDING TO PRESENT POSITION

Present position	Non-starred	Starred
Universities	56.0%	62.4%
Research institutions	3.0	12.3
Industry	12.0	6.6
Government	14.0	7.2
Private practice	3.0	3.0
Miscellaneous	5.0	1.6
Unknown	6.0	6.8

It is the purpose of this report merely to present the information gleaned from the study of the two groups of scientific men and not to indulge in speculation as to whether this information leads to the conclusion that nature is more potent than nurture in determining scientific achievement, or vice versa. When a sufficient quantity of data of this type has accumulated, its analysis may perhaps help to answer the question. The temptation, however, is great to see in the predominance of one section of the country or of a few educational institutions some indication of fundamental factors. The most significant discovery is that regarding age differences. The starred group seems to reach certain landmarks on the road of achievement earlier than the non-starred group. This difference would very probably be still greater if our two groups did not overlap in the respects referred to earlier. Such precocity carries the implication of native rather than acquired factors.

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LE DÉVELOPPEMENT DES HOMMES DE SCIENCE

(Résumé)

C'est une étude statistique des facteurs qui influent sur le développement des hommes de science. On a obtenu des données biographiques dans les quatre éditions des "Hommes de Science Américains," surtout la dernière édition qui contient les biographies d'environ 15.000 personnes. On a comparé les données des hommes les plus éminents de dix sciences à celles de quelques—uns choisis au hasard dans le livre. On a étudié les choses suivantes: endroit de naissance (état), population de la ville de naissance, collège, université, âge où les divers grades ont été obtenus, âge où le nom a paru pour la première fois dans les "Hommes de Science Américains," changement d'occupation, et occupation actuelle. On n'a trouvé aucunes différences significatives entre les deux groupes excepté à l'égard de l'âge, les membres du groupe "éminent" ayant obtenu leurs divers grades et ayant paru dans le livre à un âge moins avancé que celui des hommes choisis au hasard.

On a fait aussi des comparaisons entre le groupe "éminent" de 1927 et celui de 1906 à l'égard de la distribution géographique, des collèges et des universités auxquels on a assisté, etc. On a noté certains mouvements significatifs de la population des hommes de science vers le centre du pays. On a trouvé une décroissance étonnante du nombre de grades conférés par les universités de l'étranger en comparant les données de 1927 à celles de 1906. Enfin, on a trouvé que les plus petits collèges et universités jouent un rôle de plus en plus grand dans le choix et l'entraînement des hommes de science.

POFFENBERGER

DIE ENTWICKLUNG DER MÄNNER DER WISSENSCHAFT

(Referat)

Dies ist eine statistische Studie der Faktoren welche die Entwicklung der Männer der Wissenschaft beeinflussen. Man entnahm die biographischen Daten den vier Auflagen des Werkes *Amerikanische Männer der Wissenschaft*, besonders der letzten Auflage, welche die Biographien von 15,000 Personen enthält. Die Daten über die bedeutendsten Männer in zehn Wissenschaften verglich man mit solchen, die man auf's Geratewohl aus den übrigen Namen gewählt hatte. Man verglich die folgenden Punkte: Geburtsort (Staat), Grösse des Geburtsortes (Stadt), Vorbereitungsschule, das College in dem man absolvierte, das Alter beim Empfang der verschiedenen Titel das Alter da der Name zuerst in *Amerikanische Männer der Wissenschaft* erschien. Man fand keine bedeutsamen Unterschiede zwischen den beiden Gruppen ausser in Bezug auf das Alter, wo es sich fand dass

die Männer der "bedeutenden" Gruppe die verschiedenen Titel früher erhielten und dass die Namen in jüngerem Alter in *Amerikanische Männer der Wissenschaft* erschienen als die, der auf's Geratewohl gewählten wissenschaftlichen Männer.

Man stellte auch Vergleiche zwischen dieser "bedeutenden" Gruppe des Jahres 1927 und derjenigen von 1906 an, in Bezug auf geographische Verteilung, Colleges und Universitäten die man besucht, u.s.w. Es erwiesen sich gewisse bedeutsame Verschiebungen des wissenschaftlichen gebildeten Teils der Bevölkerung gegen den "Mittlern Westen." Es fand sich eine erstaunliche Abnahme in der Anzahl im Ausland erworbener Titel, als man die Daten von 1927 mit denen von 1906 verglich. Zum Schluss fand man dass die kleineren Colleges und Universitäten eine immer grössere Rolle in der Auswahl und Entwicklung der Männer der Wissenschaft spielen.

POFFENBERGER

THE PHYSIOLOGICAL BASIS OF NEUROSIS AND DREAM*¹

A SOCIETAL INTERPRETATION OF THE SENSORI-MOTOR² REACTIONS REFLECTED IN INSANITY AND CRIME

TRIGANT BURROW

I

For many years there have been theoretical formulations regarding the interreactions of human beings from the point of view of their biological integrations. Theoretical formulations, however, regarding the interreactions of human beings can never culminate in a science of those interrelations. A biological condition demands direct biological observation.³ A science that deals with interreactions intrinsic to us as a race must rest upon processes actually demonstrable under controlled laboratory conditions of observation. The science under which these interreactions occurring within the human phylum should properly be included is that of phylogeny or phylogenetics. There is, however, the need of a further science which studies the pathological impediments to these reactions as they are observable in the behavior equally of the neurotic individual and the normal group. This science becomes accordingly the science of *phylopathology*, and the method of its application, to

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¹It should be said that this paper presupposes the reader's acquaintance with some of the earlier essays on group-analysis in which the author has from time to time attempted to present the fundamental conceptions derived in the course of development of the group technique. For those who are unfamiliar with these earlier articles I have added a reference to them where any passage in the present study might be assisted through further explanation.

²The term "sensori-motor" is hardly adequate. "Affecto-motor" would be nearer the meaning. But for the moment it seems better to stretch a current usage than to employ a less familiar one.

³There were theories and predictions in plenty regarding the germ origin of infective processes many years before there was begun the actual demonstration of these disease-agencies as they exist in human tissues. It was this demonstration—this actual laboratory demonstration and the development of a specific technique of observation that constituted the science of bacteriology.

which I first referred as group-analysis, I now suggest be known as the method of *phyloanalysis*.

Of first importance among the data of phyloanalysis is the circumstance that social reactions as they are observed in social groups show a very different structure from the reactions observed in any single element or individual composing the group. As the human body is more than the sum of the elements composing it, so the social body is more than the sum of its elements. This unaccounted factor is precisely the physiological synthesis which interrelates the several elements composing the group and which, in so interrelating them, unites them into a functioning whole.⁴

It is of equal importance to note that not only is the content of the sum to be studied in the group very different from the content of the several elements that form the sum, but that the attitude of mind which the observer brings to his material is also wholly different. The difference is this: In observing human reactions in relation to the physiological synthesis naturally uniting them, it is necessary that the observer forego his personal restriction of judgment as a single element and that, instead, he preserve within himself a physiological and synthetic adaptation toward the reactions before him. It is required that the observer "correct for" his own subjective behavior personally and socially and so render objectively observable the physiological behavior of those social groups of which he himself is an integral, physiological part.⁵

⁴This is no new conception of course. It is merely the application of a very old conception in a new field—the field, namely, of man's own organic interrelations. That the combination of two parts of hydrogen and one part of oxygen constitutes a very different substance from these same elements as they exist separately is as old as the hills.

⁵In the field of comparative pathology it is well known that an attempt in the direction of a laboratory dissection and study of the tissues of a particular dog with a view to determining the nature of its illness, as indicated in the digression of its reaction or behavior from the prevailing type, would hardly go far toward increasing the general knowledge of science, were the student to maintain toward the dog an attitude of unconscious transference. For this attitude would permit him to view the animal under investigation *only as his particular pet dog*, possessing feelings which he could interpret only subjectively from the basis of his subjective identification with the animal before him rather than view it as an objective manifestation of the genus dog. In his transference attitude, the student, regarded phyloanalytically, is, in this situation, unconsciously preoccupied only with an unreal and inverted image of himself, which *image* has, of course, naught to do organically with the actuality either of himself or of the dog.

In the present study I shall lay special stress upon these two primary conditions of phyloanalysis: first, upon the totally different quality of finding that results when the material observed is seen as a whole rather than in its separate parts; secondly, upon the necessity for a concomitantly synthetic adaptation on the part of the observer toward the material to be observed (4).

Phylopathology, then, studies those factors which have to do with an impairment in the physiological interreactions of ourselves in relation to one another. It has to do more specifically with that factor that directly concerns the organic coordination of those balances and strains which we know as attention and which directly mediate the relationship of the organism to its environment. There is evidence that in our human species the process of attention or of immediate observation as it relates to our own feelings or interests, whether in respect to ourselves or to one another, invariably undergoes a shift in direction or a delay in time.⁶ In short, the process of attention or observation as directed upon sensations and impressions pertinent to ourselves engages at no moment the immediate object of investigation but is at all times either reminiscent or referred (7).

The emphasis of this position is fundamental in the present study. For the study of social groups as observed through the phyloanalytic technique demonstrates that the interreactions of man, due to this lapse in attention, are definitely lacking in a physiological synthesis of function and that, in the absence of this functional coordination, the conditions of interchange existing among us socially are throughout substitutive and symbolic. It is found that in place of organic interreactions there have been interposed *social images* (1) or *referred affects* (2) which are as devoid of a basis of immediacy or reality as the phantasies of the insane. As these social images are found to underlie and actuate the behavior groups of individuals representative of the social system of man throughout, it is clear that the circumstance is one in which we have to deal no longer with those individual episodes which have occupied the interest of the psychological clinician but with a phyletic con-

⁶This physiological factor of a lag in attention, qualitative as well as quantitative, will perhaps be found in some way analogous to the space-time factor as it pertains to calculations and measurements based upon the objective data of the physicists.

dition that definitely places man's "mental" reactions within the field of the laboratory biologist.

It is interesting that this factor of the social image or referred affect, interpreted through the objective observation of individuals and groups as marking an impairment in the process of attention, corresponds precisely to the factor experienced subjectively in psychoanalysis as the *transference*. This parallel is the more interesting because the transference is a factor which the technique of psychoanalysis has signalized with such great value to psychopathology and which it has employed with marked effectiveness in the treatment of the individual neuroses. The transference or the unconscious identification of one individual with another is, as we know, the subjective condition requisite to treatment by the subjective method of psychoanalysis. In the treatment of a patient by the process of phyloanalysis, on the other hand, it is a requisite condition that this phenomenon of diverted attention, resulting in the referred affect or social image, be rendered definitely objective. And so I shall in the present study abrogate completely the conception of the transference as a subjective phenomenon and ask that we address attention directly to the objective physiological condition upon which this subjective phenomenon rests. Before proceeding to this task, let me recall just what has hitherto been our content of interpretation according to the habitual subjective acceptance of the transference.

II

In a subjective view we may define the transference as that state or condition of the organism in which the feeling or will of an individual becomes referred to or rendered dependent upon the feeling or will of another and in response to which he tends to think and act through the suggestion proceeding from the personality of another rather than through processes directly motivated within himself.

Investigations in phylopathology lead to the view that the transference is a social phenomenon that is universally operative. Being of universal immanence, it is the motive force that actuates the entire mood of man's organism, individual and social. Specifically we have long been familiar with the transference as a therapeutic agent. We meet it in certain passages of the Scriptures, as "the

faith that maketh whole." It was the transference that constituted the real secret of Christ's cures, as it has been the secret of the cures of all the great healers in history. The transference was the mysterious power which made possible the raising of the daughter of Jairus, as the transference was the "faith which caused mountains to move." The important circumstance for our consideration, however, is the circumstance that the efficacy of the transference in its power of healing is equally a commonplace today.⁷

It matters not through what talisman the cure is mediated, whether through the magic of the Hindu fakir or the charm of the negro conjure-woman or through the agencies of the religious miracle-worker; it matters not whether the effect be produced through such magic amulets as the relic of a departed saint, or water made holy by the blessing of the Pope; or whether the curative reaction is produced through the technique of the con-

⁷One of our recent plays, "The Outsider," depends for its dramatic crisis upon this healing power of the transference. The hero, an unqualified practitioner, undertakes to treat the heroine for a congenital dislocation of the hip. For an entire year the girl is confined in a fully recumbent posture, as is required by the "doctor's" newly invented appliance for adjusting these conditions. At the conclusion of these arduous months, having been assured that she is completely cured, the patient attempts for the first time to walk. She falls to the floor, however, and, in the bitterness of her disappointment toward her would-be healer, she dismisses him with words of angry abuse. Believing that he has gone and that she will never see him again, she realizes for the first time that she loves him. Then suddenly in the anguish of her loss she calls loudly for him to return. But our hero, true to type, is a wise hero. He had not gone at all, but, adept lover that he is, was waiting immediately outside the door for just this "reaction." As he enters, the girl now suddenly finds herself walking to him without difficulty. It is a neat dramatic stroke for not even the adjustment of the actual anatomical lesion was competent to cure the girl in the absence of a transference toward her physician.

As an instance in actual life I am reminded of the "miraculous" restoration to health and vigor of Elizabeth Barrett Browning. This bed-ridden invalid who had lain for years in a darkened room finds herself suddenly, in response to the call of her lover, standing for the first time in the open daylight of a London street prepared for a secret elopement with him to Italy! The transference, the great healer and transformer, had suddenly reconditioned her and, like the woman who had but touched the hem of the Lord's garment, she was made whole from that hour. Closer still to all of us are the instances of the transference as they are linked with remembrances of our own early childhood, with its little injuries made suddenly well through the kisses bestowed upon them in maternal tenderness. Such is at present our subjective or feeling-sense of the transference.

sultation room and the beloved person of the physician. Whatever the medium employed, *it is the essential efficacy of the transference that it establishes a bond of dependence or reference between the individual and the tissue of social imagery that forms the web of man's present basis of interchange* (3). It is this race-wide social nexus and its subjective "mental" import that is the significance subjectively of the transference. So much, then, for the consideration of the transference as a subjective condition underlying our mental systems of therapy and in particular the principle and technique of psychoanalysis.

At the very outset of the group-analysis of this phenomenon of the transference or of the social image there was disclosed experimentally the very interesting and significant circumstance that, both for normal and neurotic individuals, the real transference-object is always *one's own self*. For the transference really embodies a relationship unconsciously established between the individual and his own image. What is commonly thought of as transference is not primarily a relationship between one individual and another but is really the relationship of the individual to himself, the transference-object being always a projection of this self-image. The individual first duplicates himself mentally, and only secondarily projects this duplicate upon others. This circumstance is not only of sociological interest, but it is exceedingly important biologically in our understanding of the origin of the neurosis as of the dream, both individual and social. It should be understood that the investigations of phyloanalysis include reactions which "normally" are called "normal." My present aim is to consider this normal phenomenon of the transference in the objective physiological interpretation required by the method of phyloanalysis.⁸

⁸As the transference is synonymous with the social image, the transference is, like the social image, a bi-dimensional phenomenon. It possesses a negative as well as a positive aspect. The transference is as powerful in the flattery and dependence it denies as in the flattery and dependence it affords. One is attached no less inevitably to the object of one's so-called hatred than to the object of one's so-called love. When we shall have come to look dispassionately upon our subjective social reactions in the large, we shall find that the great inhibitor to orderly scientific progress in this field as to man's organic race-functioning generally is precisely this interpolation of the transference. Instead of an independent inquiry in the sphere of our subjective processes as observable within ourselves, the student prefers always to be told. When told what he wants to hear, he is pleased and comforted (positive trans-

While it is true that this widespread social image or transference and its undoubted therapeutic efficacy have served the race over a necessary period of transition in its development, this image- or transference-phase of man's growth represents, like other biological epochs, a phase of temporary arrest in the evolution of the species. This transient process in the history of the phylum is comparable to the embryological "rests" with which we are familiar in man's ontogenetic history. But just as the cartilage which forms the early supporting framework of the infant organism later gives way to a deposition of bone that completely absorbs and replaces it, so this supporting structure of our affective social tissue that has temporarily served man in the early beginnings of his mental interchange must now also be absorbed and yield place to a conscious structure more in keeping with man's permanent biology. For this reason it becomes of interest to consider the possibility of studying the origin of this temporary, skeletal framework of man's consciousness. For, upon analysis, I think it may be shown that this tissue of social transference may be converted into terms that represent a definite physiological process and that this process is as demonstrable objectively in the interreactions occurring among us socially as the physiological processes to be observed objectively in the organism of the separate individual.

Let me then recall again that the transference or the social image is, in the interpretation of phylopathology, a phenomenon that

ference or satisfactory self-image); when told the contrary, he is irritated and ill-disposed (negative transference or unsatisfactory self-image). Whether he tell himself or somebody tell him is immaterial, but explanation and discussion on the basis of habitual premises are his categorical stock and store. If independent investigation is proposed he feels it to be contrary to his prerogative habit of interpretation and he can only complain, find fault, and seek to discredit the opportunity of investigation offered. It is noteworthy, too, that in his complaint he never addresses himself to the objective thesis advanced but invariably turns with fatal necessity to the magnetic center of all transference—namely, to the *argumentum ad hominem*. It is not the matter of the thesis that is his interest. But the spokesman for the thesis *must* represent an acceptable social image to him. Thus the social transference nowhere offers greater inhibition than in the sphere of the social sciences. As the transference rests upon the proprietary image, so the social sciences rest upon images and assumptions that are not less proprietary. It is a far cry, therefore, from the proprietary image of the scientist to the objective authority of science, from the preemptive traditions of habituation and transference to the common ground of consensual observation.

rests upon a definitely physiological impediment in the synthetic interreactions of human beings racially, and that, therefore, this miscarriage of man's interreactive instinct is to be understood and its remedy applied only through recourse to a physiological and synthetic basis of investigation. I have described many times our group or phyloanalytic finding relative to the origin of the social image as well as the mechanism upon which it rests, but as this mechanism is fundamental to a group or phyletic method of observation, it may be well to review it once more.

III

What is called the training of the child consists in making the child aware of those reactions which he is capable of controlling cerebrally or externally, and of inducing him to control them in such manner as to bring them into correspondence with the cerebrally controlled, external reactions existing socially about him. The child's reactions, in brief, are restricted individually to a cerebrospinal or peripheral plane of adaptation corresponding to the cerebrospinal or peripheral plane of adaptation composing his social environment. Individually he must adopt a neural pattern of behavior that reproduces the neural pattern amid which he finds himself. With one portion of his periphery, for example, the auditory or visual sense, he learns to establish a voluntary, external connection with another portion, let us say, the tactile sense. He *must* or he *must not* do such and such according as the tactile response in question appears to his visual sense and to that of others as constituting a fitting element in the generally accepted behavior-design into which he is placed (5).

This pseudo-physiological mechanism, through which one portion of the periphery of the organism is brought into relation with another portion in order that the individual's external response shall closely match the external, voluntary pattern existing about him, is the meaning of the diversion of attention that is synonymous with the referred affect or social image. I say *pseudo*-physiological mechanism, because the natural response of the organism to external stimuli would, under natural conditions, be a reaction of the organism as a whole, not a reaction restricted to the peripheral or voluntary system of responses. The natural physiological reaction would be one in which the internal organs or visceral sensations would parti-

cipate equally in the organism's response to the object to which attention has been drawn. In his reaction to the appeal of some object, the child's interest or internal tension would respond throughout his entire organism. He would move toward or away from the object with all of himself according as it attracted or repelled him. But this freer response of the organism as a whole is interdicted. Only the periphery is permitted to negotiate the in-coming stimulus and it may negotiate it only in the measure in which the individual's response matches or corresponds to the pattern composing his social milieu.

This autocratic matching of periphery with periphery is verbalized under the conventional symbol of "doing right" or "being good." But such connotations are only mental and symbolic, and when we attempt to approach the physiological actuality underlying them with such mental and symbolic images and connotations only, we are ourselves involved again in the substitutive and symbolic. There is needed the realization that in this biological restriction of the organism to a peripheral plane of reaction, we are dealing with organic categories—with categories as definitely organic as the categories of the internist or the neurologist. However superficial the mechanism, this restriction of the organism's interest to the matching of its periphery with the social periphery about it is a physiological mechanism and can be met only with physiological measures of repair.

Processes that are inter-functional are not less physiological than processes that are restricted within the circumscribed organism of the single individual. The physiology of an organism, it is true, has hitherto been confined to the study of its part or parts regarded as a functioning whole. It has not included the study of the whole of the organism (the individual) regarded as a functioning part. The study of the whole as a part function, however, is as definitely a study in physiology as the study of the part in its whole function. Whether it is the study of the part in its whole function or the study of the whole in its part function is immaterial as far as concerns the processes involved and the actions and interactions to be observed. Where, for example, through an alteration of the process of attention among us inter-individually there is produced the social image, and the organism as a whole undergoes, in consequence, an altered form of behavior with respect to itself or to other organisms, the reaction has still to do with processes of tension and release that are physio-

logical. If a distortion of attention is present in an organism and this distortion is based upon an alteration in the relation of periphery to center, of cerebrospinal to sympathetic system, the condition is a physiological one. If this physiological alteration affects the relationship peripherally and internally between any two or more organisms—if this altered physiological tension becomes inter-physiological in its scope and marks a division in the functional integrity of man's organism as a race or whole, the underlying process is still within the domain of physiological reactions.⁹

IV

There is here in this phenomenon of deflected attention and its concomitant social image a circumstance of tremendous importance sociologically. Its recognition will, I think, lead ultimately to far-reaching reconstructions in the sphere of our economic and ethical evaluations. As we know, it is the law of organic compensation that wherever a reaction is subjected to undue tension through restriction of any sort, the opposite reaction is correspondingly stimulated. Where sleep has been denied, there is induced the greater need of sleep. Suspending the palpebral reflex causes the eyelid to close with increased contractions. Likewise, if under the pressure of peripheral restriction the individual is stimulated to reactions that are socially

⁹It is not unnatural that one's daily habituations in a new and specific field of observation should lead the observer to a new and specific conceptual basis in respect both to the field of observation and to the processes observed. On the other hand, in the absence of such habituations, it is not unnatural that usages arising from such methods should affront conceptual prepossessions now long established. Now as regards the use of the term "physiological" in the present thesis. In the attempt to correlate the language of a newly adopted method with the language that prevails in respect to methods already established, one's choice lies between two courses, that of adopting a new terminology in replacement for the old or of extending the old terminology to cover the new. As the processes under observation through the technique of phyloanalysis are but an extension of biological processes to the phyletic field, it has seemed more consistent to choose the latter recourse and instead of resorting to a new term for a familiar meaning to apply the familiar term in a new meaning. Needless to say, only the opportunity to participate in actual laboratory experimentation enables the student to appreciate subjectively the difference in the nature of his own reactions (and that of others) according as these reactions are prompted by a transference (peripheral) interchange or as they are the reactions inter-individually of organisms responding as a whole. It is this opportunity alone that can give to such an experimental process a meaning that is definitely perceived as physiological.

conformable, then, concomitantly, with the social (peripheral) pressure removed, the incentive is necessarily to reactions that are *not* socially conformable. Where under certain restrictions there is placed upon the organism a compulsion toward certain social deeds, under alternative conditions there is likewise placed upon the organism an equal compulsion toward anti-social deeds.¹⁰

Now, according to the law of compensation, it is inevitable that in compliance with our present educational systems what is of advantage to the individual socially is rendered exactly the opposite to that which is of advantage to him privately. It is merely a matter of placing the premium. Where a premium is placed upon his appearance in front of others, there necessarily exists the diametrically opposite premium when there are no longer others before whom an appearance is to be made. For just as a premium or benefit is associated with the attention or strain upon the organism involved in its peripheral pattern-matching—a condition associated with the presence of others, so an equal premium is correspondingly placed upon the contrary reaction when the strain of peripheral conformity is removed—a condition associated with the absence of others. In other words, just as a premium is placed upon the reaction we experience subjectively as “good behavior” while others are looking, a corresponding premium is equally placed on the opposite reaction of “bad behavior” when others are absent.

This is interesting pedagogically, for it turns out that, under our present image-system, the child is equally taught to do “wrong” as to do “right.” It means that the moral discrimination between right and wrong is organically an empty myth—that an act which is wrong when some one is looking automatically becomes right when the coast is clear. It means that there are inherent in every moral act two equal and contrary incentives, namely, the doing or the not doing it, and that the choice is arbitrarily dependent upon the quite accidental circumstance of the side upon which the advantage happens to lie at the moment—whether the agent in the case will gain or lose by his act. Thus moral goodness becomes merely a matter of personal advantage with its constant and inevitable alternation according to the individual’s purely arbitrary and proprietary interest as fortuitously determined by the direction in which his attention *happens*

¹⁰There is here something at least analogous to Darwin’s “Principle of Antithesis” (8).

to be deflected. It is just this bi-dimensional image of self-advantage with its anti-social incentive to individual repression that constitutes the physiological motive to nervous disorders and insanity. Phyloanalysis, however, goes further and traces also to these diverted pseudo-physiological processes of attention those "normal" reactions to which we are subordinated in our habitual social "goodness" and "badness," with their congruences and conflicts, their parities and disparities—religious, economic, personal, and political.

The point is that in this restriction of function required in our social pattern-matching there is entailed an element of strain to the organism. For the organism is only artificially goaded to expressions of "goodness," that is, to those peripheral adjustments that are conformable with the peripheral adjustment existing socially about it, and the physiological consequences entail a distortion of balance or a condition of organic tension and conflict that is not alone individual but social. This strain results from a combination of surface tensions and reactions not primarily natural to the social organism. The organism is subjected to an overstimulation. As has been said, a premium is placed upon this habit of peripheral correspondence. Being "good" brings the approval and concurrence of other people who are also being "good" or matching their external appearance or periphery with the prevailing social periphery. But what is of sociological importance is the circumstance that *the stimulus which leads to the tension of conformity invites to the same degree the counter-tension of non-conformity.*

V

I should like to examine this mechanism somewhat in detail as it affects the physiological reactions of ourselves as social organisms. In separating the peripheral sphere of response from the internal sphere, a restriction is automatically placed upon each through the absence of the other, and a lack of balance occurs between the two spheres. Each, thus separated, seeks to compensate for its own deficiency in its own characteristic way—the peripheral or motor sphere in motor compensations, with the result that restrictions in the peripheral sphere of action are compensated in motor actions that are unrestricted; while the more feeling, internally sensory sphere compensates for its restriction in forms of sensory preoccupations which

likewise atone for this deeper-seated internal repression. In the motor sphere the compensations are represented in the anti-social reactions we know as misdemeanor and crime; in the internal sphere they are represented in the equally anti-social reactions we know as phantasy and dream.

The situation in which restrained action vents itself in expressions that infringe upon the person or property of others is a commonplace. This we may see in its daily outward expression. But internally the situation is identical. Feelings that may not go outward in those natural coordinations which unite the individual with his fellows in common activity are turned back into affects that are neither common nor social but whose whole purpose is a secret and insulated satisfaction for oneself. Those societal feelings which mark man's internal relationship to his fellows, the feelings of common interest, of mutual work and play, and, most dynamic of all, those feelings which unite man and woman in the instinct of sex, when denied this common expression, become correspondingly secretive and inverted. It is our phyloanalytic interpretation that the secret phantasies of self-satisfaction, which are seen to be the constant preoccupation of the isolated individual, whether normal or neurotic, are the inevitable compensation for the unnatural restriction of feeling internal to man as a social organism. There is here the physiological motive to those egoistic, self-centered, secretive manifestations represented in the neurosis and in insanity, whether its expression be sensory or motor, whether in the dream or in the deed. For it is in these private compensations, now everywhere imposed upon us socially, that the individual seeks for fulfillments that stand at the very opposite pole to the concerted feeling and function that naturally unite the race in productive activity.

Consistent with this position, the technique of phyloanalysis, contrary to the procedure in psychoanalysis, does not at any time occupy itself with past or reminiscent material. Past or reminiscent material, whether symptom or dream, is regarded as a result or by-product of a prior causal situation. This situation is contained in the attitude of the individual's social environment from the earliest beginnings of his development up to and including the moment at hand. *In brief, the moment at hand, as it exists socially, presents all the elements which first induced the individual's neurosis and, in relation to it, the dream and the symptom are alike but secondary results.*

These elements comprise the environmental incident embodied in the social image or transference. Having, then, before us at the moment the actual cause operating now as it operated within the individual's first experience, the technique of phyloanalysis, in confronting the immediate social situation, confronts directly the immediately existing cause of the individual's neurosis. I mean definitely that the social mood or the environmental affect which existed in the individual's infancy, forcing him to a recourse to image-substitution, exists now in its identical form and structure as it existed then and enforces now as then the same recourse to image-substitution. It is this social mechanism that is directly observable in the moment at hand through the technique of phyloanalysis.

It is found again and again experimentally through the actual analysis of groups that, owing to the constant influence of the social image (transference), neither the normal nor the neurotic individual is at any time capable of presenting an expression of his own spontaneous, native feeling as it pertains to the feeling and interests, the attitude and habituations either of himself or of those about him, but, on the contrary, he is influenced solely by motives of his appearance or image in relation to the appearance or image of others now automatically projected by him. And so the actual procedure in the technique of group- or phyloanalysis consists in practical exercises in the physiological (affective) control of those reflex tensions which govern the organism in its process of attention upon the immediate object presented.

We shall have gained tangible contact with these internal processes characteristic of ourselves as a race in proportion as we realize that these peripheral interreactions induced within the social organism, and now socially symbolized by us in the verbal image of "goodness," really constitute bodily tensions having to do with a socially prevalent deflection of the organism's power of attention. These habitual strains and tensions are now registered subjectively by us in the form of self-consciousness, but this reaction is only vaguely felt by us to be opposed to the fellow-conscious ease of adaptation inherent to the species. These restraints upon spontaneous interest and action, having become socially quite automatic through generations of repetition and habit, are no longer sensed by us as tension or strain but rather they have become a mode of adaptation quite acceptable to the so-called normal organism.

It is not unnatural, therefore, that we should find that those peripheral physiological adaptations which mark our interreactions socially in the self-conscious expressions of "goodness" or "badness" may only with difficulty be brought to the consciousness of man through an analysis of their physiological basis. It is not unnatural that throughout the entire body of society today there exists a condition of unconsciousness and repression that affects the processes of the social organism at large in a manner identical with the effect of the individual neurosis upon the individual patient. Neither is it surprising that as a social body we should resent the abrogation of those private and anti-social incentives that have now become habitual to us nor that, accordingly, we should present resistances to a phyletic program of analysis whose aim is the restoration of those creative impulses which lead to a healthier adaptation and coordination among us socially (6).

We have need to think of the interreactions of man's organism in their broader, phyletic scope—to establish, as it were, a blanket concept of our physiological reactions in the mass. Instead of considering this individual as divided from that (or from himself), we have need to consider rather the division that runs through and separates the inter-functioning elements of our racial organism in its entirety. We shall thus find that our reactions as a race have become divided into two broad biological laminae, so to speak—the one external and social, the other internal and instinctive, and we shall view their reconciliation not as a matter of superficial "mental" (peripheral) adjustment but as a very significant problem that involves the biological integration of man's organism as a whole (9, 10).

It is only in the group situation that these physiological inhibitions existing among us socially may be brought to observation (11, 12). This direct observation of actual material in the immediate moment as it is presented in the sum of the elements composing the group gives to such investigation the distinguishing feature of laboratory observation. Through it we are enabled to unearth the source of those maladjustments as they exist both within the element and within the group, while in our analytic attitude toward the already separated individual our inquiry is restricted to the mere dissociated element only. As long as we continue to regard the individual as a separate entity, opposite to and independent of others rather than as an integral element within an organic whole, we shall

pursue forever the various marks of the neurosis or transference, positive and negative, as it exists either in the social conformity of our peripheral pattern-matching or in the anti-social self-compensations of dreams and crime. Our very pursuit of these image- or transference-manifestations constitutes our own image- or transference-corroboration of them. In the inclusive material afforded by the group of which the observer is equally an integer within the social group-unit there is the requisite condition for observing these social maladjustments as they exist in the immediate moment.¹¹

To conclude: The unsponsored feeling of the individuals or elements composing the societal organism would naturally express itself in spontaneous interests common among them. This is interdicted; each individual must watch and compare the periphery presented by him with the periphery presented by others. Here are involved abnormal tensions socially which can only issue in abnormal compensations socially. Motor actions which are but a docile response to the praise of others tend inevitably to an opposite response when others are not at hand. Both are under an equal inducement, the one called "badness" no less than the one called "goodness." The outcome is motor self-satisfactions issuing in competition and crime, and sensory self-satisfactions issuing in insanity and dreams. Both are an anti-social manifestation for which it is useless to seek a remedy except as we adopt an anthropological view of the neuroses and accept their generic social cause, namely, a proprietary and moralistic social image of surface self-advantage that reflects a physiological maladjustment throughout the phylum. It is not to be expected that these anti-social manifestations will cease to govern man's conduct until the social nature of our substitutive image-adaptation has been subjected to social observation and analysis on the basis of its physiological and phyletic occasion.¹²

¹¹"Unconscious Social Reactions and the Economic Need of Their Analysis in Groups," a paper read at a meeting of Members of the Child Study Association of America, New York, January 25, 1927. To be published later.

¹²While I realize that the sole function of a laboratory of phylopathology is the investigation of the *causes* determining our human behavior and that its province lies wholly outside the functions administered by our courts of law, yet, from the basis of a scientific observation of social processes and their physiological causation, I cannot refrain from urging the great importance to criminology of a thoroughgoing revaluation of its fundamental interpretations of individual conduct. In view of our laboratory observa-

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tions of "normal" processes and of their physiological meaning, it is apparent that throughout the community there exist social compulsions to crime which are sponsored and incited by the very society which, on our present basis of interpretation, can only penalize them in obedience to equally compulsive social reactions. There is undoubtedly much to be learned by students and administrators of justice through a familiarity with the racial forces which are now unconsciously operative socially and which are clearly discoverable through the technique of a group or social analysis of them.

LA BASE PHYSIOLOGIQUE DE LA NÉVROSE ET DU RÊVE

(Résumé)

On essaie de considérer le problème de la névrose comme un état phylétique et de considérer la base physiologique de cette manifestation. On considère le *transfert* comme un phénomène actif dans toute la société. Soit comme individus névrosés nous sommes traités par celui-ci comme recours thérapeutique, l'état physiologique vraiment responsable de ce phénomène n'est pas encore expliqué dans la clinique ou dans la forme de nos évaluations normales. Le contraste du bien et du mal comme mobiles de l'avantage personnel est présenté dans la lumière d'*images sociales* qui reflètent encore le transfert comme altération physiologique de fonction dans le système de l'homme considéré comme ensemble organique. Cette altération physiologique se trouve dans l'interdiction morale de l'intérêt et de l'action spontanés comprise dans ces deux contrastes, l'interdiction morale étant la restriction sociale de l'organisme à la sphère périphérique (cérébro-spinale) de réaction. Cet article essaie de tracer le rapport entre le transfert comme phénomène social et ces manifestations anti-sociales montrées dans l'aliénation mentale et le crime. A cause du rôle subjectif que nous jouons socialement dans le transfert, nous n'avons pu comme individus comprendre son importance sociale. Pour cette raison on a recours à une base collective ou phylétique d'analyse pour faire reconnaître à tout le monde un rôle qu'on joue inconsciemment dans la société.

BURROW

DIE PHYSIOLOGISCHE BASIS DER NEUROSE UND DES TRAUMS

(Referat)

Man versucht die Neurose als einen phylogenetischen Zustand aufzufassen und die physiologische Basis dieser Manifestation in Betracht zu ziehen. Die *Übertragung* wird als eine Erscheinung betrachtet die in der ganzen sozialen Welt auftritt. Ob wir als soziale Individuen unbewusst davon beeinflusst werden, oder ob wir als neurotische Individuen damit als therapeutisches Heilmittel behandelt werden, — der physiologische Zustand der dieser Erscheinung verursacht ist bisher weder in der Klinik noch in der Form normaler Wertung genügend erklärt worden. Der Kontrast zwischen Recht und Unrecht als Ansporn zu persönlichem Vorteil ist im Licht sozialer Bilder dargestellt, welche wiederum die Übertragung als physiologische Beeinträchtigung der Funktion innerhalb des menschlichen Systems als Ganzes, widerspiegeln. Diese physiologische Schädigung liegt in dem moralischen Einspruch gegen das spontane Interesse und Handeln welche diese beiden Kontraste bedingen, indem der moralische Einspruch den Organismus auf das peripherische (Cerebrospinale) Gebiet der Reaktion sozial beschränkt. Der Verfasser versucht die Beziehung zwischen der Übertragung als soziale Erscheinung und jenen anti-sozialen Manifestationen, Irrsinn und Verbrechen, zu erforschen. Wegen unserer subjektiven sozialen Beziehungen zu der Übertragung war es uns als Individuen unmöglich deren soziale Bedeutung zu erfassen. Daher wählte man eine Gruppen oder phylogenetische Basis um diese unbewussten sozialen Beziehungen zur sozialen Erkenntnis zu bringen.

BURROW

RECENT IMPROVEMENTS IN DEVICES FOR RATING CHARACTER*¹

From Yale University

MARK A. MAY AND HUGH HARTSHORNE

Rating scales and rating devices as scientific instruments for the investigation of character and personality have, during the past decade, fallen into considerable disrepute. When they are used it is only as a last resort and then with apologies. Their low scientific standing is due, in part at least, to two "knock out" blows which they received about 10 years ago. The first was dealt by Thorndike in 1920 in his now famous article on the "halo" error,² and the second by Rugg in 1921-22 in four articles reporting the results of his investigations of the Army rating scales. The conclusion reached by him was that the rating of human traits by the Army method is not practicable.

The dog was down but not dead. For a while it seemed that he would die and that rating scales as scientific instruments would be completely discarded. It was necessity that saved the day. While everyone talked about the superiority of objective tests, yet it was soon found that many qualities of character yield only stubbornly and expensively to objective testing. If character and personality studies were to continue, ratings had to be revived. In spite of all their difficulties, snares, delusions, and pitfalls they are now staging a considerable "comeback."

The evolution of rating scales since 1920 is marked by steadily increasing reliability, validity, and objectivity. These improvements have come about mainly because of better techniques for securing judgments and better statistical methods of handling the results. This paper is concerned mainly with the description of improvements in technique. We shall describe four procedures developed by the

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¹This is one of a series of publications of the Character Education Inquiry which was conducted at Teachers College, Columbia, in cooperation with the Institute of Social and Religious Research.

²Attention was called to the influence of prejudice on ratings by F. L. Wells in 1908 and by N. Norsworthy in 1910.

Character Education Inquiry. Three of these are devices for securing the opinions of teachers and other adults on character qualities of children; the fourth is a device for securing the opinion of pupils concerning each other.

THE CONDUCT RATING SCALE

This is an adaptation of the type of rating scale that uses phrases or sentences to describe the points or the levels on it. It thus avoids the use of such adjectives as superior, good, average, inferior, and bad. The particular scale used by the Character Education Inquiry is a modification of a form developed by Dr. L. N. Yepsen (6, 7) of Vineland, New Jersey. The important feature of this technique is that the items of each scale represent observable modes of conduct. The judge is not asked to place the child on a scale, nor to give an opinion concerning the amount of the trait in question, but simply to give a judgment of fact concerning his behavior tendencies. For example, here is one illustration from the list of 14 behavior tendencies that we have used.

COOPERATION :

- a) Works with others, if asked to do so.
- b) Works better alone, cannot get along well with others.
- c) Works well and gladly with others.
- d) Indifferent as to whether or not he works with others.
- e) Usually antagonistic or obstructive to joint effort.

The teacher or rater is asked to check the one statement that best describes the cooperative tendencies of the subject as he has observed them. In short, the device provides opportunity for the teacher or rater to record his observations of the subject in a systematic way.

Some of the advantages of this device are: (1) The teacher is asked to give an opinion of fact concerning observed conduct tendencies. (2) The method is reliable. Yepsen reports a reliability of .77 derived from two complete surveys using two scales of 14 traits each. (3) While prejudice and vague general impressions are not wholly eliminated, this device has the advantage of not revealing to the rater the scale values of the items. (4) Dr. Yepsen also reports that the scale will satisfactorily discriminate between children who offer the greatest and the least number of social maladjustments.

CHECK LISTS

A second device for securing the opinions of teachers or adults concerning children makes use of descriptive adjectives instead of

phrases or sentences. It was suggested to us by the results of a study made by Hepner in which he found that checking of adjectives is better than checking points on a line as is required by graphic rating scales. We first went through a thesaurus and selected all the words descriptive of extremes of behavior tendencies. Samples of the selected pairs are: brutal-humane, stingy-generous, selfish-unselfish, and tolerant-intolerant. From a long list we selected 80 pairs of antonyms (160 words) and printed them on two sheets. Each sheet contains the antonyms of the other. Thus if the word "brutal" appears on sheet A, the word "humane" will appear somewhere on sheet B. Both sheets were checked for each pupil and often by two teachers. Sheet A was checked first and sheet B a week later. Thus, for all pupils studied (about 800) we have two sheets checked by one teacher. The sheets for some 600 cases were checked by two teachers. The teachers were entirely free to check as many or as few words as they desired, and they were especially urged not to check any word unless they were reasonably certain that it was descriptive of the conduct of the child under consideration.

Some of the advantages of this scheme are: (1) It furnishes excellent data for determining reliabilities. By comparing the words checked on sheets A and B, a detailed study may be made of the consistencies or inconsistencies of the rater. If, for example, a teacher checks a pupil as "tolerant" on sheet A and as "intolerant" on sheet B, we have for this pair of words a complete inconsistency. If this happens often enough the coefficient of reliability could actually be negative. That it does not happen will be seen from the coefficient of reliability, which is .88 for the whole instrument. This high reliability at once arouses the suspicion that it is due in part to the correlation of prejudices. At first glance it would appear that such an instrument would provide an almost ideal situation for prejudice to show itself. But in this weakness lies its strength. (2) This leads to its second advantage, which is that it makes possible the measurement of the halo. It was McCall who once facetiously remarked that even the diameter of a halo may be measured. If a teacher is prejudiced against a pupil, she may check against him all the bad words on the list, or she may show her good will towards him by checking all the good words. This technique provides two ways of allowing for such extremes. One is by adopting a scoring plan that will eliminate them; the other is to leave them all in and correct all subsequent correlations for their effects. We have used both methods with satisfactory results.

The scoring plan used by the Inquiry is briefly as follows: The words were classified roughly according to certain general behavior tendencies which we were studying in other ways. For example, all the words referring to cooperative or service tendencies were grouped. For each group of words, the pupil was given a score of plus, minus, or zero for each sheet. If the number of positive words checked exceeded the number of negatives, the score was plus; if the negatives exceeded the positives, it was minus; if they balanced, it was zero; or if no words in that group were checked, it was zero. Since there were four sheets for each pupil, the scores ranged from plus four to minus four. Thus the score or rating is determined not by the total number of words checked but by the sign value of their algebraic sum. Another scoring plan used the algebraic sum as it stands, thus allowing the halo to show its maximum effects. When this plan was used all correlations were corrected for the halo effects.

PORTRAIT MATCHING

This technique was suggested to us by the character sketches of Theophrastus. Selecting some character quality, such as flattery, he collected into a single picture all the characteristics of that type of behavior and used them to describe the flatterer. In reading these descriptions, one is often struck with how well some of them fit personal acquaintances. If Theophrastus could only have had a modern course in tests and measurements, he would perhaps have attempted to construct a scale of such sketches with equal steps between successive pairs. Then instead of having one sketch on flattery, he would have had 10, each representing a different degree of this trait. But, alas, Theophrastus was only a philosopher!

Following this lead, we have attempted to make a scale of character sketches. Since we were already working with the cooperative tendencies, we selected this trait for our first attempt. The material for the sketches was not secured in the usual way by collecting sketches written by children and others, but rather by making a detailed analysis of cooperative or service tendencies. Serviceful or helpful behavior was analyzed into a series of persons or objects helped, a series of motives for helping, and a series of resistances to be overcome in so doing. These lists of objects, motives, and resistances were then ranked by judges according to the degree of the tendency that each required. For example, the objects or persons helped were scaled all the way from helping a member of one's own

family to that of helping build a hospital in a strange and foreign country. The resistances were scaled all the way from giving away something for which you have no further use, and getting praised for so doing, to helping a person who didn't deserve it, and with the certainty of receiving scorn or even imprisonment for so doing. From these scaled items a series of paragraphs were constructed, each containing a description of the person or causes helped, the motives for helping, and the resistances to be overcome. These paragraphs or portraits (as we called them) were again judged by the order of merit method. A scale was then constructed, using the same general techniques that have been used in making scales for handwriting and English composition. Here is a sample paragraph taken from the center of the scale:

R. R has been taught that it is his duty to help and so his conscience bothers him if he doesn't do what he regards as his proper share. He feels that worthy causes should be helped generously and his sense of duty leads him to do tiresome and disagreeable work or take trouble to earn money for objects generally regarded as needing public support. There is doubtless a limit to what he would give, such as a tenth of his income, but he has no thought of himself or his convenience in doing his full share as he sees it, and of course very appealing objects arouse his sympathy.

This portrait has a scale value of 5. The whole scale runs from 0 to 9.

When the completed scale was given to the teachers for use, the portraits did not appear in the order of their scale values but were mixed up. This, again, was a device to circumvent the halo. The teachers were asked to read the sketches carefully two or three times before rating anyone. The rating or matching procedure from this point on was quite different from that employed by a handwriting scale. There the judge slides the specimen up and down the scale until a match is found. Here we instructed the teachers to read the first sketch carefully and then go over the list of her pupils and write the figure "1" after the name of any pupil whom the sketch seemed to fit. The process is repeated for all the sketches. At the end, there may be some children after whose names there are no sketch numbers and others after whose names there are several numbers. While this procedure causes certain scoring difficulties, these are offset by gains in accuracy and in the elimination of prejudice.

The 10 sketches used by the Character Education Inquiry have a reliability of .84. They also have a high degree of objectivity, since they describe concrete realities. Such a scale has all the advantages of the Army man-to-man type and, at the same time, avoids many of

its disadvantages. It requires more time and effort on the part of the rater than many other types, but herein lies one of its values. A good job of rating cannot be done in a hurry.

THE "GUESS WHO" TEST

This is a device for securing the opinions of pupils concerning each other. It is a modification of the matching device described above, except that here the pupils themselves do the rating. The sketches are much shorter, some of them but a single sentence, but there are many more of them. The sketches are printed on a folder entitled the "Guess Who" test. The reason for calling it a test is to induce the test set or attitude on the part of the pupils and to push to the background the rating set, or the "tattling" attitude. If the pupils feel they are being tested, they are much more likely to be frank and unprejudiced in giving their opinions of their classmates. The directions and some of the sketches are given as follows:

THE "GUESS WHO" TEST

Here are some little word pictures of children you may know. Read each statement carefully and see if you can guess whom it is about. It might be about yourself. There may be more than one picture for the same person. Several boys or girls may fit one picture. Read each statement. Think over your classmates and write after each statement the names of any boys or girls who may fit it. If the picture does not seem to fit anyone in your class, put down no names but go on to the next statement. Work carefully and use your judgment.

4. This is a jolly good fellow—friends with everyone, no matter who they are.
5. This one is always picking on others and annoying them.
6. Here is a crabber and knocker. Nothing is right. Always kicking and complaining.

There are 26 sketches. About half are positive (as, for example, number 4 above) and half negative (as number 5 above). A child's score is the number of positive mentions he receives minus the number of times his name appears on the negative items. This crude scoring technique could be refined by scaling the items.

Some of the advantages of this technique are the following. (1) It makes possible the securing of opinions of pupils concerning each other, which could not be accomplished by the use of the usual rating scales. (2) By making it a guessing game, we get away from the rigidity of rating scales without sacrificing anything in the way of accuracy. (3) The fact that the rater does not sign his name and the fact that the word "test" appears on the blank are both favorable to securing unbiased opinions. (4) The instrument has a high re-

liability. Figured by the split-form technique it has a self-correlation of .90 and a predicted reliability of .95. But this is probably higher than it would be if we repeated the test using two similar forms. Our guess is that two similar forms of this test would correlate about .90, provided each form contained 24 traits or items. By increasing the items to cover a wider variety of behavior tendencies, the repeat reliability could be raised to .95.

THE VALIDITY OF THESE DEVICES

The validity of any test is determined by finding out how well it measures that which it claims to measure. What do these devices claim to measure? They do not claim to measure conduct or character, but only reputation. What is reputation, and how does it differ from conduct and from character? Roughly the distinctions are these. A person's conduct is what he does more or less habitually; his character is what he *is*—that is, how he functions; his reputation is what others think of him.

If different persons think differently concerning the subject who is being rated, he may be said to have many reputations. These reputations are different because the judges or raters have different prejudices. The opinion which any judge or rater holds of a subject who is being rated is based partly on observed conduct and partly on personal bias. If the personal bias is eliminated, the judgment is based presumably on conduct. This is why those who use ratings to validate tests are so anxious to get rid of the halo effects. But the halo is a part of reputation because reputation consists of the opinions of others regardless of how they are formed. They may be based on observed conduct, or on prejudice, or even on hearsay.

The devices described above evidently measure two types of reputation. The first is a pupil's reputation among his teachers. The second is his reputation among his fellow pupils. The validities of these reputations depend upon their reliabilities. There is no outside criterion with which they can be correlated. The validity of reputation among teachers can be determined only by correlating one teacher's opinion against that of others, or by correlating the opinions of the same teacher secured at different times, or by correlating the results of different techniques. We have employed the third one of these procedures. The average intercorrelation of the 3 sets of teacher ratings is .80. If this figure is stepped up 3 times, there being 3 scores, by the Spearman-Brown formula, the combined

teacher rating would have a repeat reliability of .92. That is, ratings by one teacher using 3 different schemes should correlate .92 with ratings by the same teacher using 3 more similar schemes. We may further predict that 3 such ratings should correlate .96 with a very large number of similar scores.

The validity of reputation among pupils has not been computed in this way because the data were not obtained by different techniques. It is without doubt as high and perhaps higher than the validity of teacher reputation.

The correlation between teacher reputation and classmate reputation throws considerable light on the extent to which ratings are influenced by personal prejudice. The correlation between teachers' opinions as expressed on the check lists, conduct records, and deportment (portraits were not used in this), and the score on the pupil's "Guess Who" test is, for a school population of 800, grades 5 to 8, .477. This may be taken as a measure of what the teachers and pupils have in common when judging any pupil. This common ground is probably observed conduct.

THE CORRELATION BETWEEN CONDUCT AND REPUTATION

In the past, ratings have been used quite freely as criteria for the validation of objective tests. The success with which this can be done depends on the correlation between test scores and ratings. If the tests are conduct or performance tests, and if the ratings are on the traits that the tests measure, then the correlation between test score and that part of ratings which is not prejudice ought to be high. But, on the other hand, if the halo or prejudice is left in the ratings, the correlations with conduct will be low. No one has ever determined the relation between true reputation, which includes prejudice, and true conduct as measured by objective tests.

We have made a beginning at this while developing a battery of objective character tests. We have measured 4 behavior tendencies. These tendencies are (1) the tendency to deceive, (2) the tendency to help or to be of service, (3) the tendency to self-control, and (4) the tendency to persistence. The results of these studies will be reported elsewhere.³ Ratings were secured from teachers and fel-

³The results of the Character Education Inquiry will be published by the Macmillan Company in a series of volumes entitled "Studies in the Nature of Character." The first volume, *Studies in Deceit*, and the second, *Studies in Service and Self-Control*, have already been published.

low pupils on each of these tendencies, using the techniques described above. The correlations between reputation and test scores are low. They vary from .10 to .30.

These low correlations indicate that conduct, as measured by objective tests, and reputation for behavior tendencies have very little in common. The common elements are probably represented by the degree to which the ratings are based on observations of conduct.

THE CORRELATION BETWEEN CONDUCT AND RATINGS THAT ARE FREE FROM PREJUDICE

Let us assume that any reputation score (that is, a rating by teachers or by pupils) is based partly on observation of conduct and partly on general impression, prejudice, and the like. Let us assume, further, that the part that is based on observation of conduct is that part which is common to teachers' ratings and to pupils' ratings. The problem is to find the correlation between this common reputation factor and conduct. This is accomplished by using Spearman's formula for correction for attenuation. The results are as follows: for honesty the correlation is .35; for service, 1.04; for self-control, .80; and for persistence, .52.

These correlations mean that if we had perfect measures of the conduct tendencies, on the one hand, and perfect ratings based on observed behavior and entirely free from prejudice, on the other hand, the resulting correlations would be as indicated above. The correlation of 1.04 in the case of the service tendency is interesting because it indicates that the area of conduct measured by the tests is identical with that on which the observational part of the ratings is based. The low correlation for honesty (or rather deceit, for it was the negative side that the tests measured) is interesting because it indicates that the areas measured by the tests do not have much in common with the areas of observations on which the ratings were based. This is not surprising because deceit is a thing that the child tends to cover up. If a pupil is successful in cheating on the tests, he is also likely to be successful in deceiving his fellow pupils and teachers concerning his deceitful tendencies. Furthermore, in this case, the reputation scores cover only classroom honesty, while the honesty tests cover many types of out-of-class honesty.

These results indicate that if we had a definite area of behavior adequately sampled by a battery of objective tests, and if we had the same area adequately rated, being careful to eliminate prejudice and seeing to it that the ratings are based on observations of conduct,

then the correlation between such ratings and conduct scores should be near unity. In short, the conditions under which the correlations between reputation free from prejudice and conduct would reach unity are: (1) that the area of behavior be carefully defined and adequately tested by a battery of objective conduct tests, (2) that the same area be covered by ratings secured from many persons who know the subjects, (3) that these ratings be entirely free from prejudice and based on observations of conduct.

If, then, it is possible to secure correlations of unity between conduct and reputation freed of prejudice, the practical problem arises as to whether or not ratings should after all be the instruments used to study character. Since conduct tests are expensive in both time and money, and since ratings are easier to secure, should we not reverse the usual process of using ratings to validate tests and, instead, use the tests to validate the ratings? The answer to this question hinges on the relative reliabilities of the tests and the ratings. It is a question of whether true conduct can be predicted from a fallible rating better than it can be predicted from a fallible test. The question is this: item for item, hour for hour, and dollar for dollar, which is the less fallible, the test or the rating? We have found that, when freed from halo by using judgments of teachers and pupils, the ratings are no more reliable than the tests; in fact, item for item, they are much less reliable. On the other hand, a hundred ratings may be secured as easily and as cheaply as one test. This is surely a problem for further research.

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QUELQUES AMÉLIORATIONS RÉCENTES DES MOYENS D'ÉVALUER LE CARACTÈRE

(Résumé)

Quatre moyens d'évaluation sont décrits et évalués. Trois de ces moyens sont destinés à trouver les opinions des maîtres d'école concernant leurs élèves et le quatrième à trouver les opinions des élèves les uns des autres. Nous avons une description brève de chacun: (1) *L'Echelle d'évaluation de conduite*. Le trait dominant de cette échelle c'est que le maître évalue la conduite des élèves et ne donne pas une opinion sur la quantité du trait chez l'enfant. (2) *Comparaison de listes marquées*. Le maître compare deux listes d'adjectifs descriptifs marqués. Les listes sont arrangées de sorte que chacune contient les antonymes de l'autre. (3) *Comparaison de portraits*. Le maître compare chaque élève à une série de portraits écrits déjà mis en échelle. Le processus d'évaluer les traits de caractère d'un élève est très semblable à celui d'évaluer son écriture par une échelle d'écriture. Le résultat de l'évaluation de n'importe quel trait est la moyenne des valeurs d'échelle des portraits qui selon le maître décrivent l'élève. Cette technique est unique et a de grandes possibilités. Le quatrième moyen est destiné à trouver les opinions des élèves les uns des autres. Il s'appelle le test "Devinez qui," et consiste en une série de courts portraits écrits. Chaque élève écrit après chaque portrait le nom de ses compagnons qui lui semblent y ressembler.

Ces moyens sont évalués statistiquement en termes de (a) leur objectivité, (b) leur validité, et (c) leur constance. Ils sont satisfaisants à ces trois égards. Quant à l'objectivité ils évitent les éléments subjectifs du préjugé ou bien donnent des moyens de les mesurer et d'en tenir compte. Quant à la constance ils montrent chacun une constance d'à peu près 0, 90. Quant à la validité ils ont été comparés aux tests objectifs de caractère et au cas d'un type de conduite (les tendances coopératives) la corrélation corrigée pour l'atténuation atteint vraiment l'unité.

Les auteurs en conclusion soulèvent la question si l'on ne peut mesurer le caractère d'une façon plus satisfaisante par les évaluations que par les tests objectifs.

MAY ET HARTSHORNE

VERBESSERTE METHODEN ZUR BEWERTUNG DES CHARAKTERS

(Referat)

Vier Vorschläge zum Studium des Charakters werden beschrieben und bewertet. Drei derselben bezwecken das Urteil der Schullehrer über ihre Schüler zu ermitteln, und der vierte das Urteil der Schüler über einander. Eine kurze Beschreibung derselben folgt: (1) *Eine Skala zur Bewertung des Verhaltens*. Der charakteristische Zug dieser Skala ist dass der Lehrer das Verhalten des Schülers bewertet, doch ohne seine eigene Meinung über die Stärke der Eigenschaften des Kindes zu äussern. (2) *Listen von beschreibenden Eigenschaftswörtern*. Diese werden so zusammengestellt dass jede die Antonyme der andern enthält, und der Lehrer unterstreicht die Eigenschaften welche er in dem Kinde wahrnimmt. (3) *Vergleichung mit einer Charakterskizze*. Der Lehrer vergleicht die Schüler mit einer Serie von Charakterskizzen die vorher bewertet wurden. Das Verfahren ähnelt

dem, das man anwendet bei der Bewertung der Handschrift nach einer Handschrift Skala. Die Leistungswertung des Schülers in irgend einer Eigenschaft ist der Durchschnitt der Skalawerte der Skizzen die ihn—nach der Meinung des Lehrers—beschreiben. Diese Technik ist originell und vielversprechend. (4) *Der "rate wer" Test* besteht aus einer Serie kurzer Charakterskizzen. Jeder Schüler schreibt bei jeder Skizze die Namen der Schüler, auf die sie—seiner Meinung nach—passen.

Diese Methoden sind statistisch bewertet (a) nach ihrer Objektivität, (b) ihrer Gültigkeit und (c) ihrer Zuverlässigkeit. Sie erweisen sich befriedigend in allen drei Punkten. In Bezug auf Objektivität vermeiden sie entweder die subjektiven Elemente des Vorurteils oder ermöglichen es diese zu bewerten und demgemäss in Betracht zu ziehen. Im dritten Punkt,—jede zeigt eine Zuverlässigkeit von nahezu .90; in Bezug auf Gültigkeit—man verglich sie mit objektiven Charakter Tests und für eine Art des Verhaltens Neigung zum zusammenarbeiten, erreichte die Korrelation—corrigiert zur Attenuierung tatsächlich Einheit.

Zum Schluss werfen die Verfasser die Frage auf ob nicht doch trotz allem der Charakter etwa befriedigender durch Bewertungen bemessen werden kann als durch objektive Tests.

MAY UND HARTSHORNE

THE CONTRIBUTION OF TEN CHRONICLES-OF-AMERICA PHOTOPLAYS TO SEVENTH-GRADE HISTORY TEACHING*¹

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I

DESCRIPTION OF THE PHOTOPLAYS USED

The photoplays used are historical dramas setting forth a number of important developments in American History very much as the playwright unfolds his plot by dialogue, change of scene, and action. The length of the photoplays, 3 reels, is fixed by school practice which makes it almost imperative that the story be unfolded, if it is to be presented in its entirety, within a period of from 40 to 45 minutes. Accuracy of portrayal is vouched for by specialists in the phases of history portrayed. The dramatic structure of the photoplays has been carefully supervised by Professor George Pierce Baker of the Drama Department of Yale University. Of the 15 photoplays already produced, 10 were used in the experiment. These 10 may be briefly described, as follows.

JAMESTOWN: A faithful impression of the Jamestown settlement in 1612 under the stern rule of Sir Thomas Dale. The daily life of the colonists. The ever-present menace of the Indians, whose hostility is aggravated in part by Spanish intrigue. The capture of Pocahontas, her marriage to John Rolfe, and the end of Powhatan's war of extermination, factors contributing to the successful establishment of the first permanent English settlement in America.

THE PILGRIMS: The struggle for religious freedom as typified by the story of the Pilgrims. Starting with the experiences of the Separatists at Scrooby, England; their migration to Holland during 1607-1608. Twelve years later,

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¹A full report of this study including detailed descriptions, tables, tests, and supplementary materials will be published by the Yale University Press.

the departure of the devoted band for America. The voyage of the Mayflower. The landing on Plymouth Rock. Hardships and suffering during the first winter. The refusal of the Pilgrims to return to England and other incidents revealing their faith and devotion to the ideal of freedom in religious thought and expression.

THE PURITANS: The economic background of the Massachusetts Bay Colony. Life in early New England, 1630, contrasted with the court of Charles I. The political moves behind Thomas Morton's effort to discredit the Puritans in England and to bring about the revocation of their Charter. The rise of political dissension at home, including the departure of Roger Williams. The capable leadership of Governor Winthrop successfully bringing the colony through this dual crisis in its affairs.

PETER STUYVESANT: A summary of the outstanding events from 1653 to 1664 which reveals how Dutch New Amsterdam became English New York. Life in the picturesque Dutch colony under the stern rule of Stuyvesant. The attitude of England toward Dutch colonial ambitions on the Hudson. The decision, strengthened by reports of Englishmen on Long Island, to send a fleet against New Amsterdam. The growing restlessness of Stuyvesant's citizens under his autocratic administration. The arrival of the English fleet. Preparations for battle. The bloodless surrender of New Amsterdam by Stuyvesant after standing out against his counsellors and citizens to the last moment.

THE GATEWAY TO THE WEST: Suggesting the beginning, in 1753, of the bitter conflict for the vast wilderness west of the Alleghanies between France, working south from Canada, and England, pressing westward from her seaboard colonies. Presenting, also, a charming picture of life in Old Virginia. In detail, the experiences of young Colonel George Washington, sent by Governor Dinwiddie to protest the French occupation of the Ohio Valley. Washington receives a curt refusal. A successful skirmish brings down upon his small force a large body of French reinforcements. He retreats, but is forced to stand at "Fort Necessity." To save his command, he surrenders; a significant defeat since it opened the eyes of England's ministers to the seriousness of the French menace in America.

WOLFE AND MONTCALM: The bitter struggle between France and England in America, culminating in the battle of the Plains of Abraham and the fall of Quebec in 1759. The acute situation in world politics, which prompted William Pitt to send an army overseas under command of General James Wolfe. The situation in New France, with General Montcalm hampered by the jealousy of Vaudreuil, Governor-General. The military strategy of Wolfe. His attack on Quebec. Montcalm's desperate defense. The clash on the Plains of Abraham. The occupation of Quebec and the arrival of the English fleet the following spring.

THE EVE OF THE REVOLUTION: Depicting the most significant incidents of the decade 1765-1775 and, through these, interpreting the state of mind of

the people as the movement for independence gained impetus. In detail, re-creating scenes incident to the Stamp Act and the stand against "Taxation without Representation." Also re-creating the "Boston Massacre," the "Boston Tea Party," the Salem Assembly, the rides of Paul Revere and William Dawes, Jr., the sharp military clashes at Lexington Green and Concord Bridge, and the retreat of the British. In short, the most notable events preceding the actual outbreak of the War of Independence.

THE DECLARATION OF INDEPENDENCE: An account of the efforts of a small group of patriots to bring about a unanimous vote in favor of independence, which reveals the three outstanding attitudes of public opinion in 1776, as represented by Tories, Conservatives, and those in favor of absolute independence. The influence of pamphleteers, typified by Thomas Paine and his "Common Sense"; the unofficial gatherings of delegates; the concern of John Adams, Franklin, and others as to the attitude of France; the proceedings of the Second Continental Congress, culminating in the famous session of July 2nd, 1776, when a unanimous resolution for independence was secured. The formal adoption of the Declaration on July 4th, and the subsequent excitement.

YORKTOWN: The progress of the War of Independence between January and October, 1781. The hardships and sufferings of the American troops. The problems facing General Washington due to discouragement and mutiny. The international aspects of the campaign of 1781, and the aid rendered by French leaders. Washington's march South. The arrival of the French fleet in the Chesapeake. The successful outwitting of Clinton and Cornwallis. The battle of Yorktown and the subsequent surrender of Cornwallis.

VINCENNES: The struggle for supremacy along the frontier when the American colonies were fighting for independence in the East. Hamilton, British Governor-General of the Northwest, occupies Vincennes to curb the influence of westward-spreading pioneers. George Rogers Clark, to rid the country both of Hamilton and of his Indian allies, strikes out from Kentucky and reaches Kaskaskia before cold weather in 1779. Hamilton, protected by a seemingly impenetrable wilderness, feels secure until spring. Grasping his opportunity, Clark presses on across the "Drowned Lands" in the face of tremendous hardships and captures Vincennes, breaking the influence of the British over the Indians and winning for the Republic the vast territory from which later were formed the states of Ohio, Indiana, Illinois, Michigan, and Wisconsin.

Photoplays of this type have not heretofore been subjected to experimental evaluation. Of the films used by Freeman (2), only 5 could be classified as historical motion pictures, and 4 of these were in the field of economic history. All of them were quite different from the photoplays used in this experiment. The most com-

prehensive motion picture in the experiment described by Freeman was "French Explorations in North America," produced by the Society for Visual Education. The footage was 734 feet, less than one reel. Only 13.2% of this included motion pictures. Fifty-five and fifty-five hundredths per cent consisted of animated cartoons and maps. The story element was entirely lacking.

The contributions to history teaching which have been predicted for the Yale Chronicles-of-America Photoplays are, in descending order of frequency of mention in 61 sources:

- 1) The creation of interest
- 2) The production of a more vivid imagery and more lasting impressions
- 3) The modification or creation of attitudes and ideals
- 4) The enrichment of history teaching

This order is not so much an indication of relative educational importance as it is of the effect which the photoplays had upon the writers. This is borne out by the fact that in the same sources the qualities of the photoplays most frequently mentioned are: first, dramatic interest; second, reality; third, historical fidelity; and fourth, beauty.

II

PLAN OF THE EXPERIMENT

The purpose of this experiment was to measure the contribution of the photoplays to enrichment, retention, and the creation of interest. These are the first, second, and fourth kinds of predicted contributions mentioned in the preceding paragraph. The third, effect upon attitudes, is included only in so far as it is covered in manifestations of interest.

The plan of procedure was as follows:

- 1) To measure the extent to which the photoplays contributed enrichment by

a) devising tests² with which to measure in a full and worth while way the results achieved in those instructional units in which the photoplays were used; and

b) giving these tests before and after instruction.

- 2) To determine whether the enrichment, if found, was secured at the expense of normal progress in the prescribed course of study by

²These tests were devised by D. C. Knowlton, and will be referred to as the Knowlton Tests.

a) giving a standardized test at the beginning and end of the experiment.

3) To analyze the enrichment contributed, if found, by

a) separating the Knowlton tests into four parts as follows:

(1) questions calling for knowledge of time

(2) questions calling for knowledge of historical geography

(3) questions calling for knowledge of persons

(4) questions calling for knowledge of the interaction of events, or causal relationships, or interrelationships other than time

b) comparing the four kinds of contributions.

4) To measure the contribution of the photoplays to retention by

a) giving the Knowlton Tests a third time.

5) To measure the contribution of the photoplays to the creation of interest by

a) having observers keep detailed records of pupil participation in classroom discussion;

b) having the pupils rank history among their other subjects of study;

c) getting records of history read outside the classroom;

d) measuring the amount of voluntary reading under controlled classroom conditions.

This plan was carried out in Grade 7 of the Troup Junior High School of New Haven, Connecticut. The grade was composed of 521 pupils, divided into 15 sections of approximately 35 pupils each. The pupils had been sectioned, within the limitations of administrative necessity, on the basis of Otis Classification Test quotients and teachers' judgments. The 15 sections were designated by letters in alphabetical order from A, the highest, to O, the lowest. The 15 sections were taught by 6 teachers, A, F, and K, by one; B and L, by another; C and H, by a third; D, I, and N, by a fourth; E, J, and O, by a fifth; and G and M, by a sixth. For the whole grade the median mental age was 12 years and 11 months, and the median intelligence quotient was 105. For reasons stated later, sections F, H, I, J, L, and M were chosen to constitute the experimental group, and B, C, G, K, N, and O were chosen to constitute the control group.

The course of study pursued by the experimental group differed from that of the control group in only one respect, viz., that it included the use of the photoplay in addition to the textbook and such

other classroom equipment as was common to all seventh-grade history and social studies classes. No other visual material was introduced into the classroom except that which was already in use there, such as wall and blackboard maps. Teachers were at liberty to make such use of the pictures and maps in the textbooks as might commend themselves, provided they used such materials in control and experimental groups alike. Two textbooks had normally been used in these classes, Gordy's "History of the United States," and Beard and Bagley's "History of the American People." These were supplemented by a manuscript textbook in mimeographed form and without illustrations, covering the period which was being studied. The principal of the school, who knew the manuscript was in preparation, had expressed a desire to use it because of its emphasis upon the larger European background, and also because of the contacts which it made with geography. D. C. Knowlton planned and directed the history work of the grade from about November 1, 1927, until the close of the school year in June, 1928. An effort was made to make the teaching as effective as possible. This was done to permit the measurement of the contribution of the photoplays to good teaching. For the purposes of the experiment the instruction was divided into 5 units as follows.

Unit I: Settlement 1600-1660; The English Move Westward

- | | |
|---------|-------------------|
| Jan. 31 | Test One |
| | Two lessons |
| Feb. 6 | Film—The Pilgrims |
| | Three lessons |
| 14 | Film—The Puritans |
| | Two lessons |
| 20 | Test One repeated |
| 21 | Voluntary reading |

Unit II: Life in Europe vs. Life in America

- | | |
|---------|-------------------|
| March 6 | Test Two |
| | Two lessons |
| 12 | Film—Jamestown |
| | Three lessons |
| 19 | Test Two repeated |
| 20 | Voluntary reading |

Unit III: England Extends her Domain and Ousts the Dutch

- | | |
|----------|-----------------------|
| March 21 | Test Three |
| | Five lessons |
| April 2 | Film—Peter Stuyvesant |
| 3 | Test Three repeated |
| 4 | Voluntary reading |

Unit IV: Ambitious Kings and Conflict

- | | |
|----------|------------------------------|
| April 25 | Test Four |
| | Three lessons |
| 30 | Film—The Gateway to the West |
| | Three lessons |

May 7	Film—Wolfe and Montcalm
	One lesson
9	Test Four repeated
10	Voluntary reading
<i>Unit V: The American Revolution</i>	
May 14	Test Five
	Three lessons
21	Film—The Eve of the Revolution
	Three lessons
29	Film—The Declaration of Independence
	Two lessons
June 4	Film—Yorktown
	Three lessons
June 11	Film—Vincennes
	One lesson
13	Test Five repeated
14	Voluntary reading
Sept. 7 & 10 All tests repeated for retention	

The tests were given before and after each unit of instruction, instead of before and after the whole experimental period, for two reasons: first, to permit an evaluation of the results in terms of the consistency in the five measurements in case the difference between the control and experimental groups was not statistically significant; and secondly, which was more important, to measure learning apart from forgetting.

All photoplays were projected in the regular social studies classrooms. They were projected from the rear upon a Trans-lux or Daylo screen by a portable machine carrying standard width non-inflammable film. A lens of short focal length was used with the throw varying from $4\frac{1}{2}$ to 6 feet, and producing an image of approximately 16x24 inches. The machine was operated by an experienced operator. As the pictures were projected, the titles were read by the teacher. On the day the photoplay was shown to the experimental group, the control group was given, in addition to their textbooks, such information as was found to be in the photoplay but not in the texts.

III

SOME MEASURES OF VALIDITY AND RELIABILITY

1) *The Teaching.* Was the teaching of the experimental period changed to fit the photoplays? In other words, if an enrichment is reported, may it be interpreted as an enrichment of good teaching as it is usually measured? The Van Wagenen Information Scale C-2 was given at the beginning and end of the experiment to 9 of the 15

sections. The 9 were fairly representative of the whole grade in that, of the 6 omitted sections, 2 were bright, 2 average, and 2 dull. The 9 sections made an average gain of 14.4 points. Allowing for the effect of the experimental factor and for practice effect, this improvement made in 6 months is equal to the improvement normally made in both the sixth and seventh grades in the Minnesota cities from which the norms were obtained. The period covered by the experiment was therefore one of real progress, as measured by the use of this standardized scale.

2) *The Knowlton Tests.* Are the Knowlton Tests of such a nature as to measure the extent to which this progress was accompanied by an enrichment of a worth while sort, or are they made up of questions of petty detail, such as can be answered only by seeing the photoplays? It has already been stated that each was designed to measure a full unit of instruction, and the knowledge called for was thought to be worth acquiring. The extent to which the knowledge called for was worth acquiring was checked as follows: Five competent judges³ were asked to read through the tests and to check those questions calling for knowledge which in their judgment was not worth acquiring in the junior high school. There were 395 questions⁴ in the 5 tests. The number of these questions checked varied for the 5 judges from 7 to 31. Altogether, 61 different questions were checked. One was checked by all 5 judges; 9 were checked by 3; 4 by 2; and 47 by 1 only. In the opinion of 3 of the 5 judges, 385 or 96% of the 395 questions call for worth while knowledge.

As a check on the extent to which the questions asked for a knowledge peculiar to the pictures, 10 history teachers were given the tests. They were grade, junior, and senior high school teachers, selected entirely upon the basis of their willingness to take the tests and their not having seen the photoplays. Seventy-four per cent of the questions were answered correctly by 6 or more of the teachers.

Only 4 questions, 1% of the total number, called for a knowledge

³1) Miss Mary Hardin, Social Studies Department, New Haven State Normal School.

2) Mr. Tyler Kepner, Supervisor of Social Studies, Brookline, Massachusetts Public Schools.

3) Miss Bessie L. Pierce, Department of History, University of Iowa.

4) Mr. E. B. Smith, State Department of Education, Albany, New York.

5) Professor Fremont Worth, Peabody Teachers College, Nashville, Tenn.

⁴Each scorable item is called a question.

not possessed by a majority of the teachers tested and pronounced not worth acquiring by a majority of the judges. In other words, the criteria used reveal only a negligibly small percentage of poor test questions. Results will be based upon the use of all of the 395 questions. They are only slightly affected by the presence of "poor" questions, and that in a way to minimize the contribution of the films, not to enhance it. That is, when the contribution of the photoplays was actually computed from the use of the most frequently known and most worth while questions only, the contribution was higher than it was with all questions included. In view of this fact, the tests are to be criticized, if at all, for not measuring the full contribution of the photoplays to worth while teaching.

They had to be applied without preliminary use and improvement, but they proved to be well adapted for use in the seventh grade (no undistributed scores before or after instruction), and they gave total measures of learning and of retention which were more than sufficiently reliable for group comparison. The reliability⁵ of the combined initial score was .92; of the combined gains, .73; and of the combined retentions, .77.

3) *Measures of Interest.* In getting measures of pupil participation in classroom discussion, the observers counted the number of pupils raising their hands to answer the teacher's question until the rank of 8 sections in this respect by half of their records agreed with the rank by the other half except for a reversal in the seventh and eighth positions. This means a coefficient of reliability (by the rank difference method) of .99 for their total measures. By the same method, the reliability of class measures of hand showings which were not directly teacher-initiated was .94. These measures, being adequate for the comparison of single sections, are still more so for several sections combined.

Pupil scores for number of participations, (*a*) when called on, (*b*) when permitted to take part, (*c*) to contribute from outside sources, and (*d*) to ask questions, were obtained with reliabilities on the whole measures of .85, .95, .63, and .80, respectively. The lowest of these coefficients is quite high enough for the purposes of group comparison.

The ranking of 7 subjects of study according to the order of pref-

⁵Computed between halves and estimated for the whole, as reported above, by the Spearman-Brown formula. Coefficients of correlation unless otherwise specified are Pearson product moment coefficients.

erence was asked for, the first time by the principal and the second time by the homeroom teachers. The coefficient of correlation between the rankings is .57, and the reliability of the combined ranks is .73.

The occasions when the pupils read history in the school library were too few to warrant the computation of a reliability coefficient. The lists of reading done outside of school were more extensive, but they were not obtained under controlled conditions. On the other hand, the measures of voluntary reading in the classroom seem valid and reliable. Pupils were told the day before the voluntary reading was to be done that they should bring in whatever they wanted to do if they did not want to read the supplementary history reading material which was to be provided. When the papers were placed upon the teacher's desk the pupils were told that the reading did not count on school work or school marks. They read a paper, signed their names, answered four easy questions on what they had read with the material before them, returned the paper, and took another if they wished. They were credited with reading those papers on which two or more of the answers were correct. This method of scoring need not have been used, however, for there were very few signed papers with less than two correct answers on them.

The incentive was not strong enough to give a normal distribution of scores. There was a disproportionate number of low scores. The material was ample, for no pupil read all that was provided. The scores therefore afforded a satisfactory comparison of groups, for each group read without limitation of material; the only limitation was that of inclination. That inclination was subject, of course, to the varying demands of other school subjects. The comparison, however, of 6 sections with 6 sections on 5 occasions tends to minimize such uncontrollable factors. The reliability coefficient for the full pupil measure of voluntary reading is .73.

4) *Experimental Control.* The experiment was conducted under unusually good experimental conditions. All study was directed and supervised in the classroom; books were not taken home. Dr. William H. Martin, the principal of the school, was more than cooperative. He contributed to the direction of the experiment in an interested and intelligent manner. The principal's attitude was reflected in that of his staff, both teaching and clerical. Experimental work had been conducted in the school before, and the teachers knew the necessity for control. They exercised it carefully and conscientious-

ly. In the case of two teachers, the extent to which they were consistent in their teaching from section to section was measured. Alongside of each of the 395 questions in the test, record was made of the number of pupils who learned to answer it correctly in the course of the experimental instruction. This is a good measure of the extent to which the same things were taught in different sections. Control sections D and N were taught by one teacher, and control sections E and O were taught by another teacher. We combined the measures for D and O and for E and N. The coefficient of correlation between the combined measures is .76, and for all six teachers it may be estimated to be .91. If many pupils learned to answer a certain question in one section, then many learned it in the other control section taught by the same teacher. From the number of pupils in one section who learned to answer a certain question, there could be predicted, with a probable error of two pupils, the number who would learn to answer the same question in another section taught by the same teacher.

In every way the teacher's influence was held as constant as possible, and whatever was done in one section was done in all sections taught by that teacher. One observer, for instance, did all the observing in the sections taught by the same teacher, and if an observer was present in one of a teacher's sections, he was present in the others also. On those occasions when history time was lost in one section, as an offset, an equal amount of time was used for other purposes in the other sections taught by that teacher.

No particular effort was made to keep conditions constant from one teacher to another, for all comparisons have been made between control and experimental groups upon which each teacher had an equal influence.

5) *Equality of Groups.* The grouping of the pupils into homogeneous ability sections, all different, afforded a good opportunity to evaluate the photoplays in terms of the ability handicaps which they enabled the experimental group to overcome and afforded an opportunity for testing the precision of experimental control by comparing two control groups taught by the same teacher. On the other hand, this plan of homogeneous grouping made it necessary to match control and experimental groups as a whole, without matching within each teacher's influence. This method is inferior to matching by individuals, other things being equal.

The objection to the method of matching used lies in the possibility

of a teacher being a better bright-section teacher than she is a dull-section teacher, or vice versa. The mental ages of 4 control sections taught by 2 of the teachers are such as to permit a determination of the extent to which that factor invalidates comparison in the case of these 2 teachers. D and N are bright and dull sections taught by one teacher; E and O are bright and dull sections taught by another teacher. The average of 300 measures of gain for sections D and O is $11.8 \pm .5$. The average of 297 measures for sections E and N is $11.2 \pm .5$. The difference is $.6 \pm .7$. Being less than its probable error, the difference is a statistically insignificant one. But suppose it does reflect a tendency, say, for the teacher of D and N to do relatively better work in the brighter section. There seems to be no reason for doubting that such differences in gains between groups supposedly alike would be minimized in a comparison of groups taught by 6 teachers instead of 2. Even if there were a preponderant tendency for the 6 teachers to be better teachers of high-ability sections than of low—or a reverse tendency, the difference shown above would still be less in our comparisons of the whole group, for the experimental sections were selected so as to permit the control group to be made up in 3 cases of higher-ability sections and in 3 cases of lower-ability sections.

A still more convincing test was made of the method of group matching used. Seventy-four pupils in the experimental group were paired with 74 pupils in the control group. In the case of each pair the mental age was equal and both pupils were taught by the same teacher. This comparison showed a slightly larger experimental group excess than was found in the main comparison.

For all comparisons the experimental group was so selected as to be slightly less able than the control group. In the experimental group selected, the average mental age was lower, and the group included a smaller percentage of boys. This makes for some error in the results but gives greater certainty as to their nature. It was considered necessary to consider the proportionality of sexes because Vostrovsky (4), Eaton (1), and others have found evidence of boys reading more history than is read by girls, and Van Wagenen (3) reports higher norms for boys. In view of these facts, boys may be expected to learn more history, other things being equal. In the groups used for our comparisons, the percentages of boys in the three major comparisons were: control group, 48% boys, and experimental group, 46%; control group, 48%, and experimental group, 47%; control group, 49%, and experimental group, 40%.

Having secured a control group slightly more able than the experimental group on the basis of mental age and sex, the inequality was confirmed by the yearly school marks in English and mathematics. These marks were two-thirds class marks and one-third test, and were based upon the work done during the year of the experiment. The passing mark was 60. The experimental group average was 71, and the control group average was 75.

IV

SUMMARY STATEMENT OF RESULTS AND CONCLUSIONS

On the Knowlton tests, designed to measure enrichment of a worth while sort, the experimental group gain exceeded the control group gain by 19%. The difference is 6.7 times its P.E.,⁶ when N equals the number of measurements, and 2.7 times its P.E., when N equals the number of pupils measured.⁷

In order to show what it means for the experimental group to have learned 19% more than the control group, another control group was used of sufficiently greater ability to permit it to make the same amount of gain as was made by the experimental group. This control group was found to be, on the average, over a year more mentally mature, more than one grade further advanced so far as their knowledge is concerned, and brighter than the experimental group by an amount which would rank them 20 in 100, as compared to a rank of about 60 for the experimental group.

The greater gain of the experimental group consisted of learning about, in descending order, causal relationships, persons, and places. The experimental group gained less of worth while time knowledge, but learned twice as many worth while causal relationships not frequently known by history teachers.

This enrichment did not take place at the expense of standardized progress, as measured by the Van Wagenen History Scale, Information C-2. In fact, in this respect, also, the experimental group made a slightly greater gain than was made by the control group. This difference in gain is equivalent to doing a year's work of 40 weeks in 38.5 weeks.

Experimenters in visual education have been criticized, sometimes justly and sometimes unjustly, for using tests which magnify the

$${}^6\text{P.E.}_{\text{diff.}} \text{ is in all cases } \sqrt{\frac{\text{P.E.}^2}{mn_1} + \frac{\text{P.E.}^2}{mn_2}}$$

⁷The ratio of difference to its P.E. is, unless otherwise stated, based upon an N equal to the number of pupils measured.

contributions of the aids being measured. In order to check the tests used in this experiment in this respect, they were appraised by expert judges and by history teachers who had not seen the photoplays. Against these criteria, it was found that, in so far as results above reported are in error because the tests used asked for knowledge not worth acquiring, or not commonly possessed by history teachers, they are in error by minimizing the contributions of the photoplays.

Retention, over periods varying from 3 to 7 months, was measured in two ways which we call relative and absolute, relative being the percentage retained of what was gained, and absolute being the retained gain or net gain after forgetting.

The experimental group retained more, relatively, of knowledge of relationships, to the learning of which the photoplays also contributed most. Of person and place and knowledge, the experimental group retained relatively about the same or a little less. Of time knowledge the experimental group clearly retained relatively less. Of all combined they also retained relatively less.

In the so-called absolute units, even though the experimental group forgot more, they retained more of relation, person, and place knowledge. Of time knowledge they retained less. Of all combined they retained more. Compared with the 19% contribution on full gains, the contributions based on net gains is about 12%. The loss was due chiefly to the forgetting of time knowledge.

There was no review of the teaching of the last experimental unit because it was followed by the summer vacation. This is the only unit for which the factor of review is constant. For this unit the experimental group learned 25% more than the control group and retained 27% more than the control group retained. The difference in retained gains in this case is 1.7 times its P.E.

The control and experimental groups were compared as to the reading of history in the school library and outside of school, as to their liking for history as compared with their liking for six other subjects studied, and as to information contributed in class and obtained outside. In none of these measures did the experimental group average exceed the control group average.

However, more weight should be attached to the findings in the classroom, since they were obtained under controlled conditions. In the classroom discussion the experimental group participated more to the extent of about 10% and showed more desire to participate. This was especially true of the more voluntary participations. The

difference upon which the 10% is based is 3.6 times its P.E. The experimental group also voluntarily read more supplementary history material, their excess being about 40%. A larger percentage of the experimental group contributed to the measures of both participation and reading; and for those contributing, the averages for the experimental group were higher. The difference upon which the 40% is based is 5.2 times its P.E.

When one group will voluntarily read more history, and voluntarily take part in classroom discussion of history more extensively than will another group, there is a real sense in which the first group is more interested in history than the second, even though this greater interest is not expressed in the ranking of subjects. In this sense the experimental group showed a greater interest in history than was shown by the control group.

The conclusions of varying significance, which may be drawn respecting the contributions of the photoplays, are as follows.

- 1) The 10 photoplays made a large contribution to the teaching of an enriched course of study, increasing the pupils' learning by about 19%.

- 2) This contribution was of such a magnitude that average children with the aid of the photoplays learned as much as bright children did without them.

- 3) The photoplays, while providing this enrichment, made a small contribution to completing the minimum essentials in less time. In this respect, the estimated saving in a 40-week year was $1\frac{1}{2}$ weeks.

- 4) The photoplays were most effective in teaching a knowledge of interrelationships involving the interaction of events and of forces. They increased the pupils' learning of this sort 35%, or about twice as much as they increased the gaining of all kinds of historic knowledge.

- 5) The next largest contribution was to the teaching of historical personages. The increase of learning of this sort attributable to the photoplays was 23%.

- 6) The contribution to the teaching of historical geography was 19%.

- 7) The photoplays interfered with the teaching of time relationships. They decreased by 10% the learning of such relationships.

- 8) The photoplays effectively taught a worth while knowledge of the interaction of events which is not frequently possessed by history teachers.

9) In the part of the experiment in which there was no review between teaching and retest for retention, the contribution to retention was greater than, or at least equal to, the contribution to learning. This was the contribution of 4 photoplays to the teaching of the Revolution. The pupils learned 25% more by the use of the photoplays and remembered 27% more after 3 months.

10) In general, the contribution of the photoplays was not as great to retention as to learning. The pupils learned about 19% more with the aid of the photoplays but retained only about 12% more.

11) This was due chiefly to the fact that the photoplays interfered with the retention of time knowledge to about twice the extent that they interfered with gaining it. By seeing the photoplays, pupils gained 10% less of time knowledge and retained 20% less.

12) The contribution of the photoplays to the remembering of historical geography was smaller than their contribution to learning it. Pupils learned 19% more and remembered 14% more.

13) The contribution to the retention of knowledge of persons was also less than the contribution to the gaining of it. With the aid of the photoplays, pupils learned 23% more and remembered 21% more.

14) The contribution to the retention of knowledge of historical relationships other than those of time was greater than the contribution to gaining this knowledge. Of such relationships pupils learned 35% more and remembered 43% more.

15) The effect of the photoplays upon pupil participation in classroom discussion was in detail as follows:

- a) more recitations were made at the request of the teacher;
- b) a larger percentage of the class recited;
- c) those reciting did so more often;
- d) on these occasions more hands were raised;
- e) more remarks were volunteered by the pupils not directly as a result of a teacher's question, i.e., upon those occasions when their own desire to participate more evidently prompted them;
- f) a larger percentage of the group so volunteered;
- g) those volunteering did so more often;
- h) on these occasions more hands were raised for permission to participate;
- i) more questions were asked;

- j) a larger percentage of the group asked questions;
- k) those who asked questions did so more often;
- l) fewer contributions came in as a result of outside interest;
- m) a larger percentage of the group made such contributions;
- n) those contributing did so less often.

16) The increase in the total number of pupil participations attributable to the use of the photoplays was 10%. This increase is equivalent to 46 more participations in a year by each pupil, or about 1600 more in a 35-pupil section.

17) Seeing the photoplays did not cause the pupils to rank history appreciably higher among 6 other subjects studied.

18) It did not cause pupils to read more history in the school library during the school library periods, judging from the school librarian's record kept during the experiment.

19) It did not cause them to read more history outside of school during the experimental period, judging from their own lists, made from memory at the end of the experiment.

20) It did cause them to read voluntarily more supplementary history material under controlled classroom conditions:

- a) 40% more reading was done;
- b) a larger percentage of the group chose to read;
- c) the average amount for those reading was larger.

The evaluation of these conclusions calls for a consideration of the following questions.

1) What are the probabilities that an obtained result was due to errors of sampling and of measurements?

2) Granting a real difference, to what extent does precision of experimental control justify the interpretation of group differences as the influence of the experimental factor, and equality of results as the lack of such influence?

3) Assuming a real difference attributable to the experimental factor, what is the educational significance of the fact?

In view of these considerations, the writers believe that the findings of the experiment which should be emphasized are:

1) The photoplays contributed materially to the gaining and retention of worth while knowledge, particularly of knowledge of interrelationships, other than time.

2) They produced more pupil participation in classroom discussion.

3) They caused the pupils who saw them to read voluntarily more

supplementary history reading material under controlled classroom conditions.

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LA CONTRIBUTION DE DIX FILMS DES "CHRONIQUES DE L'AMÉRIQUE" À L'ENSEIGNEMENT DE L'HISTOIRE DANS LE "SEVENTH GRADE"

(Résumé)

On a employé les films dans l'enseignement de six classes du "Seventh Grade" de l'école élémentaire. On a fait la comparaison du progrès de ce groupe expérimental et celui d'un groupe de contrôle de 6 classes de la même école, enseignées par les mêmes maîtres. On a choisi le groupe expérimental de sorte qu'il était un peu moins capable que le groupe de contrôle, pour qu'on n'attribue pas les différences en faveur du groupe expérimental à des différences de groupe dans l'aptitude à apprendre.

On a montré les films dans les salles de classe ordinaires, à l'heure ordinaire de l'histoire. Les maîtres ont employé les mêmes méthodes dans l'enseignement de leurs classes de contrôle et de leurs classes expérimentales. On a fait la comparaison des résultats des heures passées à lire et à subir l'enseignement oral, d'un côté, et, de l'autre côté, des résultats de la même durée dont on a passé les quatre cinquièmes à lire et à enseigner oralement comme d'habitude et l'autre cinquième à voir. Un bon contrôle du facteur temps a été possible parce qu'on a étudié seulement pendant l'heure ordinaire de l'histoire sous la direction du maître.

Les élèves qui ont vu les films ont appris 19 pour cent de plus et se sont souvenus d'environ 12 pour cent de plus. La contribution des films à l'enseignement a été d'une telle importance que les élèves de capacité moyenne ont appris autant avec les films qu'ont appris les élèves supérieurs sans les films. Ils ont participé aux discussions de classe plus volontairement et plus fréquemment de 10 pour cent, et ils ont lu volontairement 40 pour cent de plus des lectures d'histoire supplémentaires.

KNOWLTON ET TILTON

DIE ZEHN "DIE CHRONIKA AMERIKAS" FILME, ALS CONTRIBU-
TION ZUM GESCHICHTSUNTERRICHT IN DER
SIEBENTEN KLASSE DER VOLKSSCHULE

(Referat)

Diese Filme wurden 6 Monate lang beim Geschichtsunterricht im 3ten Jahr in 6 Klassen benutzt. Die Fortschritte dieser Experiment Gruppe wurden dann mit denen einer Kontroll Gruppe von 6 Klassen in derselben Schule und mit denselben Lehrern verglichen. Man hatte die Experiment Gruppe so gewählt dass sie etwas weniger fähig war als die Kontroll Gruppe, so dass eine mögliche Überlegenheit derselben nicht ihrer höheren Intelligenz zugeschrieben werden konnte.

Die Filme wurden in dem gewöhnlichen Klassenzimmer während der gewöhnlichen Geschichtsstunde gezeigt. Die Lehrer wandten dieselben Methoden im Unterricht der beiden Gruppen an. Man verglich die Leistungswerte der Klassen Stunden, die mit Lesen und Besprechen zugebracht wurden mit, Leistungswerten der Klassen Stunden wo ein fünftel der Zeit mit dem Anschauen der Filme ausgefüllt war. Genaue Kontrolle war möglich da alles während der gewöhnlichen Geschichtsstunde und unter Aufsicht der Lehrer stattfand.

Die Schüler, die die Filme sahen, lernten 19 Prozent mehr und behielten ungefähr 12 Prozent mehr als die andern Schüler. Der Erfolg der Anwendung der Filme war so bedeutend dass Schüler von mittelmässiger Fähigkeit mit Hilfe der Filme ebenso viel lernten wie viel intelligentere Schüler ohne dieselben. Die Ersteren nahmen öfter aus freien Stücken Teil an der Erörterung und um 10 Prozent öfter, und lasen 40 Prozent mehr ergänzende Bücher als die übrigen.

KNOWLTON UND TILTON

I. A QUANTITATIVE COMPARISON OF RATIONAL RESPONSES OF NEGRO AND WHITE COLLEGE STUDENTS*¹

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One of the most notable changes in psychology in the last 35 or 50 years is that produced by the concept of individual differences. The realization of such mental differences extending with law-abiding continuity throughout the wide ranges of the scale, and the growing conviction that inborn factors of structure and neural connection form no inconsiderable part of the cause lead inevitably to careful experimental studies of individuals and groups. Many such comparisons of the white and negro "races" have been made, particularly with children as a basis; but the relative abilities of the superior adults as represented in the colleges have not received sufficient attention. This investigation proposes to contribute some additions to the knowledge of racial differences or similarities by comparing the rational responses of negro and white college students in certain tests. The results are reported in two articles, the first giving the median differences in the abilities of the two groups in the given tasks; and the second, which will follow, containing an analytical study of certain tests for the purpose of discovering possible typical or qualitative trends of difference.

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Before proceeding to a discussion of the results found in this investigation, it will be well to review briefly previous studies of the comparative abilities of whites and negroes. These are summarized in a table which lists both sources and results, beginning with the year 1913 (63), the date of the first use of Binet tests in comparing negroes and whites. The more important comparisons of children are also listed because more representative sampling of children is possible, because probably the I.Q. remains fairly constant, because the environmental factors are not so prominent with children as with adults, and because a larger body of research deals with them. In this field of racial psychology, careful reviews have previously been made by Bruner (9) for the years of 1913-1914, by Woodworth (74) for 1914-1916, and by Garth (21) for 1916-1924. Also, Peterson (48) prefaces his monograph, "The Comparative Abilities of White and Negro Children," with a review and criticism of studies before the year 1923, and the Negro Yearbook for 1925-1926 contains a bibliography (pp. 508-510).

When we leave the studies of the relative intelligence of white and negro children (Table 1, Part 1) and proceed to consider the adults (Table 1, Part 2), we find the field quite bare except for the Army investigations of the white and negro draft, reported in whole or part by Brigham (8), Ferguson (15), Trabue (69), and Yerkes (76). The conclusions deduced from these data have been subjected to much unfavorable comment. Reviewing Brigham's book (8), Bagley (4) takes exception to most of the conclusions. "In other words, however reliable the army tests may be as measures of difference in native intelligence when applied to groups that are homogeneous with respect to educational opportunities, they have no reliability whatsoever as measures of intelligence levels when applied to groups so large and so heterogeneous educationally as were the state contingents of recruits in the draft army." On the basis of tables in the army report (76, pages 724-725), Bagley computes medians and finds that the median for all northern negroes reported surpasses that of whites in Missouri, Kentucky, and Arkansas. From this and from the correlation of .91 found between intelligence and elementary school facilities in the nations from which recent immigrant groups come, he concludes, though this conclusion is based upon facts subject to more than one interpretation, "Either schooling did affect intelligence or this theory of Nordic superiority is knocked

TABLE I
A REVIEW OF INVESTIGATIONS OF MENTAL DIFFERENCES BETWEEN NEGROES
AND WHITES
PART I. CHILDREN

Date	Investigator or reporter	Tests	Negro cases	Results
1913	Baldwin (6)	Substitution	30	Negroes attempted 62% of work of the whites, and made 245% more errors.
1913 1914	Strong (63) Morse (43)	Binet	120	10% of whites and 29% of negroes were retarded more than one year; 5.3% of whites and .8% of negroes were advanced more than one year.
1914	Phillips (52)	Binet	58	The M. A. of the average negro was .7 years below his C. A., while the average white was .17 years above his C. A.
1915	Pyle (58)	Various group tests	408	Negroes 67% as efficient as whites. Median negro deficiency 1.00 Q_w .*
1916	Pyle (59)	Learning	130	Negroes have 75 to 80% the learning capacity of the whites.
1916	Ferguson (14)	Various group tests	421	Negroes 75% as efficient as whites.
1917	Sunne (64)	Binet and group tests	126	Negro deficiency one M. A. year.
1919	Mitchell and Rosanoff (42)	Free association	300	34% of negroes surpassed the average white in specific common associations.
1919	Pressey and Teter (57)	Cross out	187	14% of negroes reached median of whites of corresponding age. Negro median I.Q. was 80 to 85. Negroes scored equal to whites two years younger.
1920	Murdock (44)	Cross out	225	Median negro deficiency .85 Q_w .

* Q_w gives the size of the difference of medians in a standard unit, namely, the quartile deviation of the white distribution.

TABLE 1 (cont.)

1921	Arlitt (1)	Binet	71	Median negro I.Q. 83, white 106. Difference between negroes and whites having the same (low) social status was .09 in favor of whites.
1921	Haggerty (27)	Delta	3000	Percentage of negroes overlapping white median are: rural 20%, city 14%.
1921	Peterson (47)	Multiple choice and learning	315	80-95% of whites surpass the negro median.
1922	Arlitt (2)	Binet	243	Median I. Q. of negroes decreases with increasing age from 100 at 5 to 6, to 79 for 10 to 15 years. When paired for social status: difference .5 I.Q. at 5 years in favor of negroes; 7.0 I.Q. at 8 to 9, 9.7 I.Q. at 8 to 15, in favor of the whites.
1922	Jordan (33)	National Intelligence Test	247	20 to 26% of negroes surpass the white median. Median negro I.Q. 75.
1922	Pintner and Keller (55)	Binet	71	Median negro deficiency 1.41 Q _w . Negro I.Q. 88, white, 95.
1923	Thorndike (68)	Institute of Educational Research	350	Less than 4% of negroes pass the white median.
1923	Peterson (48)	Pressey	734	Negro I. Q. 75.
		Pressey	744	Median negro deficiency 1.35 Q _w .
		Otis	218	Median negro deficiency 1.81 Q _w .
		Otis	115	Negro I. Q. 57.
		Otis Primary	177	Median negro deficiency .88 Q _w .
		Haggerty	32	Median negro deficiency 1.15 Q _w .
		Haggerty	37	Negro I.Q. 92.
		Myers	90	Median negro deficiency 1.70 Q _w .
1923	Peterson and Harrelson (48)	Rational learning	284	Median negro deficiency 1.69 Q _w .
1924	Sunne (65)	National Intelligence Test	1112	M. A. of negro 1 to 1.5 years below white. 21% of negroes reach white median.
		Myers	1113	
1925	Garth and Whatley (23)	National Intelligence Tests	1272	Negro I.Q. 75. Increase of education exercises a constant influence on I.Q.
1925	Luckey (39)		1575	Selected groups: 30% of whites and 65% of

1925	Sunne (66)	Binet	802	50% as many negroes rated low, 33% as many rated above an I.Q. of 120.
1926	Hirsch (32)	Various group	449	Average I.Q. of whites 98, of negroes 85.
1926	Koch and Simmons (35)	Myers National Intelligence Test Pintner-Cunningham Detroit	135 246 87 132	39% of city negroes pass white median on Myers. City whites surpass negroes on all tests. With age constant, 54 to 90% of whites exceed negro median. City negroes surpass rural whites on Myers.
1926	Goodenough (24)	Goodenough	613	Median I.Q. of whites 100, of southern negroes 77, of California negroes 83.
1925	Peterson, Lanier, and Walker (51)	Rational learning Mental maze Disc transfer	46 46 46	Median negro deficiency .76 Q_W . Median negro superiority .11 Q_W . Median negro deficiency .47 Q_W .
1928	Peterson (50)	Rational learning	87 40	Median negro deficiency in Nashville in time, 1.25 Q_W ; in repetitions, .10 Q_W ; in error, .44 Q_W . Median negro deficiency in Chicago: in time, .62 Q_W ; in repetitions, .81 Q_W ; in errors, 1.00 Q_W .
Unpub- lished†	Peterson and Lanier	Rational learning Mental maze Disc transfer	40	Median negro deficiency for all southern, .65 Q_W ; for Nashville white and Chicago negro .22 Q_W . Southern negro deficiency compared with Chicago negroes, .29 Q of Chicago negro distribution.
Unpub- lished†	Peterson and Lanier	International, Myers, and Binet group	86	Median negro deficiency 1.64 Q_W .

PART 2. ADULTS

Date	Investigator or reporter	Tests	Negro cases	Results
1916 1919	Ferguson (14) Trabue (69)	Army tests Army tests	155 8244	Negroes 77% as efficient as whites. Negro deficiency 1.18 Q_W .

†Now published: Peterson, J., & Lanier, L. H. Studies in the comparative abilities of whites and negroes. *Ment. Meas. Monog.*, 1929, No. 5. Pp. 156.

TABLE 1 (cont.)

1921	Yerkes (76)	Army tests	18891	M. A. of whites is 13.1; negroes, 10.4. Negro deficiency 1.85 Q_w .
1923	Peterson (48)	Army tests		10-12% negroes exceed white mean.
1923	Pintner (54)	Army tests		27% northern negro draft reach white median.
1923	Whitney (72)	Army tests		Superior: 12% white draft; .7% negro.
1926	Wallis (70)	Army tests		Inferior: 21% white; 79% negro.
1920	Derrick (12)	Binet	55	Negro median I.Q. 103; white, 110. The difference is .58 Q_w or a comparative negro deficiency of about 15%.
1922	Popenoe (56)	Binet	400	16% negroes reach white median. Negroes rated superior: 3.4% of Ohio, 3% of Ala., Ga., Miss. Rated inferior: 46% of Ohio; 86% of Ala., Ga., and Miss.
1923	Yerkes (77)	Literacy		31% of New England whites and 80% of New England negroes were illiterate.
1924	Feingold (13)	Modified Army Alpha	58	Freshman I.Q. 95 for negroes and 103 for whites.
1926	Bond (7)	Terman group	170	Whites 25% more efficient.
				Percentiles
				Whites
				25 95
				50 128
				75 139
1926	Wang (71)	Ohio State University	44	A slight general negro inferiority, but no outstanding difference.
Unpublished (to appear soon)†	Peterson and Lanier	Otis	243	Negro median deficiency is 1.88 Q_w .
		Myers	130	Negro median deficiency is 1.63 Q_w .
		Atkinson	204	Negro median deficiency is 2.16 Q_w .
		Five International tests	135	Negro median deficiency for all the tests combined is 1.97 Q_w .
1930	Graham (present data)	Nine tests	99-187	Negro median deficiency based on the median of the 9 tests is .51 Q_w . Negro mean deficiency based on the mean of the 9 tests is .38 Q_w . 36 to 37% of the college negroes reach or pass the white median.

into a cocked hat." Of the previous investigators of adult negroes, only three hold the educational factor fairly constant, namely, Derrick, Wang, and Feingold. However, in each, the number of negro cases is quite small, and Derrick did not control the element of "sampling," for he, due to the scarcity of negro college students, used a few pupils from high school.

Peterson (48) sums up in the following statement many of the important conclusions given in Table 1: "The intelligence difference revealed by the comparison of the two races amounts to a deficiency of the negro median in comparison with that of the white man of approximately 1.4 P.E. units of the white distribution. This means that about 83 percent of the whites are more efficient than the negro of median ability, while approximately only 15 to 18 percent of the negroes reach the white of median ability." He also points out (49) that the interpretations of a number of the reported investigators are fallacious, since they assume, for example, that a negro median of three-fourths the white median means a negro efficiency only three-fourths of the white. The interpretation in terms of ability will depend on where the zero point of ability lies. He suggests that differences be stated in P.E. units of the white distribution, thus permitting an approximate statement of the percentage of whites surpassing the negro median.

Ferguson (14), Peterson (48), and Koch and Simmons (35) find that the negroes of lighter color did better than the darker ones. They assume that the lighter pigmentation indicates relatively more white blood in the negro-white mixture and that the greater proportion of white blood is responsible for higher intelligence. The genealogical data of Herskovits (31) for Harlem, rural West Virginia, and Howard University give some support to the first assumption; but they also show, in regard to this trait of skin pigmentation, wide variability and overlapping among the four groups, namely, the unmixed negro, more negro than white, same amount of negro and white, and more white than negro. The assumption that the greater proportion of white blood in the negro-white amalgam is responsible for higher intelligence is challenged by the data of Gregg (26) and of Herskovits (30). The latter finds correlations so low as to be negligible (less than .20) between the Thorndike College Entrance tests and each of the typical physical traits, namely, width of nose, thickness of lips, and black and white elements in skin pigmentation.

Another point he makes is that a social factor operates to increase the number and to improve the standing of the lighter negroes. The pertinent questions then are: (1) Is such a social factor an observed fact? (2) Does it operate to bring into the lighter group increased inheritable ability independent of the increase of white blood? On the first question, Herskovits offers data of a type which any careful observer may note to indicate that the lighter negroes of the race now have more and better opportunities along social, educational, and business lines and a better established cultural and economic background than have their darker companions. In a more or less subtle and invidious manner, the negro community is forced to recognize the value of a light complexion as a social and business asset. In addition, one must acknowledge that the lighter group of the slavery period was favored in holding positions as house servants, in receiving gifts of property, and in being stimulated to acquire some education. To the second question, Herskovits makes no direct reply, but it, too, may be answered in the affirmative, though no statistical evidence can yet be given. Unquestionably, the light colored girls, other things being equal, are considered the more attractive and are sought by the ablest men of the negro race; while the girls, also, tend to choose the ablest men. This brings the best intellectual ability of the race into the light group. May not this often be non-correlated with the increase of white blood? This fact, in so far as it is true, raises the questions: (1) What is measured by correlations based upon a comparison of intelligence and skin pigmentation? (2) How much is that correlation due to an increased amount of white blood and how much to a constant and selective social factor that brings the cream of the whole race into this favored class? Certainly, if anyone should argue that any white inheritance produces more intelligence than the best possible negro inheritance, he would, by so doing, necessarily nullify all classifications of feeble-minded and low grade whites. Then, if such a constant social factor is present and unmeasured, even high correlations between increasingly light skin pigmentation and intelligence must be interpreted with great caution. We may illustrate this point by supposing that a high correlation for children is obtained between height and intelligence test scores. Then, if we should ignore the varying ages and infer that tallness is also indicative of a higher intelligence, we arrive at a most doubtful conclusion; for age has a high correlation with both height and intel-

ligence, and the high correlation between tallness and intelligence may be due to the factor of age. In like manner, in a correlation between skin pigmentation and intelligence, if a selective social factor occupies the relationship age has in the above illustration, then these correlations need most cautious interpretation.

In the same book (31), Herskovits makes another point which is pertinent to any racial comparison of negroes and whites. He found that the unmixed group was relatively small, only 22% in a total of 1551 genealogies studied. Nevertheless, he interprets his anthropological measurements to show that the American negro, although an amalgam, is a definite physical type, i.e., a definite racial group. This fact is important in relation to a common objection that such testing in schools of higher learning does not test a pure negroid group. In a large measure, it probably does test a selected group of the American negroes, which, in spite of blood mixtures, forms a distinct racial type.

TESTS AND SUBJECTS

The tests given to the two racial groups were selected with a view to securing those which had been used previously with considerable numbers and found fairly valid, which had such objective methods of scoring as left nothing to the bias of the marker, and which assigned tasks of such varying complexity and degree of difficulty in comprehension that they were probably more sensitive to the effects of native ability than to environment. Eight group tests and one individual test were used. The following is the series given:

1) The Otis Self-Administering Tests of Mental Ability are so widely known that they need no description. Form A of the advanced examination was used, and the 20-minute rather than the 30-minute period was allowed, since Otis bases most of his college norms on the former.

2) The Army Group Examination Alpha (78) is even better known. Forms 6 and 9 were used in this study.

3) The Myers Mental Measure (45) is a non-verbal test consisting wholly of pictures and is patterned after the Army Alpha and Beta. It has four divisions, each containing a series: I, a test of ability to follow directions; II, a completion test; III and IV, tests in solving mixed relations or analogies.

4) The group scale is an adaptation to group administration of the

individual Binet tests. It is mainly the work of Dr. Lanier, now of New York University, produced when he was National Research Council research assistant to Peterson in the Jesup Psychological Laboratory at Peabody. The following tests, many of them ranging over several years in varying difficulty, are included: making change, repeating digits, ball and field, finding rhymes, comprehension of questions and of physical relations, reversing the clock hands, mentally counting boxes, ingenuity tests, and a free association test.

5) The Hard Opposites Test, the work of Dr. Means (41), is, as the name implies, one of naming word opposites. Each word in the test has been assigned a standard value based upon its difficulty which was determined by testing hundreds of college students in various localities of this country.

6) The Word Building Test has been described by Pintner (53). It consists in building as many words as possible out of certain given letters in a period of five minutes. The A E I R L P form was used.

7) The Mixed Relations No. I, or Analogies Test, is a logical relations test and is described by Woodworth and Wells (73).

8) The Atkinson Ingenuity Test, developed at Peabody, is an adaptation of the principle of combinations in algebra. Sixteen letters are placed in a square, four in each row and column. The subject is instructed to make as many four letter selections as possible from the square, taking no two from the same row or column.

9) The Rational Learning Test is an individual test devised by Dr. Joseph Peterson (46). It is a learning test which requires both memorizing and reasoning. In the 10-letter form employed, the letters A, B, C, to J, inclusive, are named in order but are assigned numbers in a random order. The subject is required to guess numbers between 1 and 10, inclusive, until he finds the number identified with each letter, whereupon the experimenter says "Right," and proceeds to the following letter. Guessing may be reduced by careful thinking. The learning process is completed when the subject is able to name twice in succession, without error, all the numbers for the series. In order to prevent coaching, five different forms of the test, three used by Dr. Peterson (46), and two additional employed by Dr. B. F. Haught (29), were given.

The Administration of the Tests. Great care was taken to follow rigidly the instructions for these tests, all of which have been stand-

ardized or specifically described in manuals or published articles. At Fisk University, the tests were given to classes simultaneously or in successive hours to prevent coaching. The Otis, Myers, and Hard Opposite tests were repeated there, but after a 3-month interval had elapsed.

The subjects to whom the tests were given were, with the exception of 83 whites in the Rational Learning test, students in southern colleges and drawn largely from the same section. A definite attempt was made to insure a random sampling in each race and to have the groups equally representative as to geographical location, college departments, college classification, and sex. The negro subjects were tested during the winter and spring quarters of 1926 at Fisk University, Nashville, Tennessee, in the departments of education, history, and psychology. The tests were given in from 3 to 8 classes with from 99 to 187 different individuals. The scatter included students classified from freshman to senior but was pronouncedly bunched toward the freshman end. The white subjects were tested within a year of the time when the negroes were tested. They were students in the following schools: Peabody College for Teachers at Nashville, Middle Tennessee State Teachers College at Murfreesboro, and the University of Kentucky at Lexington. As stated above, one exception to the foregoing statement must be made, that in the Rational Learning test 83 subjects, mostly sophomores, were in the University of Minnesota in 1916. The distribution for the tests among the various white schools is as follows: 83 of the subjects were from the University of Minnesota and 17 from Peabody for the Rational Learning; for the Alpha, Otis, and Mixed Relations, all the subjects were from Peabody; for the Myers, 54 came from Peabody and 52 from Middle Tennessee State Teachers College; for the Word Building, 66 were from Peabody and 64 from the University of Kentucky; Atkinson, 50 from Peabody and 50 from Middle Tennessee State Teachers College; Hard Opposites, 52 from Peabody and 222 from the University of Kentucky; for the Binet Group test, all subjects were from the Middle Tennessee State Teachers College. All the scores of the groups tested are included except in the case of the Middle Tennessee scores. Here students given more than one of the tests used were selected first; then, additional students were added in the order of every third student from a class alphabetical arrangement, equating as nearly as possible

the college classification and sex of the negro group. The sexes are approximately equal in the negro distributions, but in the white, about two-thirds are females. More freshmen are contained in the negro distributions (about 40% more for the Rational Learning, Alpha, and Otis), although some might more properly be rated as sophomores, since they had been in college the previous year but had insufficient hours to be so listed. The range for the freshmen in the negro group is from 47 to 71%, and in the white group, using only those whose exact classification is known, from 16 to 45%. With the freshmen and sophomores combined, and the white students in sophomore classes considered sophomores or lower, the groups are about comparable, except that approximately 12% more negroes will be in the lower classes for the Alpha, and about 15% more for the Otis. In the various tests, the range of the percentage of students in the two lower classes is for the negroes 60 to 84% and for the whites 40 to 73%.

To obtain the same motivation for negro and white groups is a serious problem. The average opinion of the negro group is opposed to intelligence testing, thinking it used only for purposes of segregation in institutions or for claims of white superiority. In this case, because those who gave the tests had been several years at Fisk and were well-known, cooperation as an incentive was probably much above the average. The negro students were definitely told that no administrative use would be made of any of the results, but the exact purpose of the testing was not explained to either group.

The relative representativeness of this sampling of white and negro college students in regard to each race as a whole was not measured quantitatively. Nor was the relative representativeness of the sampling of the Fisk students and of the white colleges compared with other negro and white schools in the same general section. Certainly, at least, the first of these problems needs some quantitative answer before broad applications to the race at large can be admitted. Data for sufficiently conclusive results in either of these investigations are very difficult to obtain. For the first, it would be necessary to test or obtain test scores for a random sampling of adults of both races under conditions where the educational and social opportunities were approximately equal. Outside the original army data, no available sampling has been made; and with the general unfavorable attitude of the negro group toward intelligence testing for racial com-

parisons, it would be difficult to gain admission to negro high schools for such a program of testing as this demands. Of course, logical deductions might be made from such data as the relative proportion of negro and white students in college or of those completing a college course. Probably the information that a smaller proportion of negroes than of whites attends and finishes college does have some significance as a crude measure of the relative mental ability of the two races; for, in the long run, those lacking ability do not acquire the economic surplus that allows a college education, and the abstract curricula do eliminate the lesser intellects. The significance of this data as a measure of ability is, however, much reduced by the fact that before 1912 only 5000 negroes had completed college courses, but that, since that time, more than 6000 have graduated from college. Certainly, to accredit all this increase to a gain in native intelligence is manifestly impossible. Such factors as better educational and economic opportunities must be given proper recognition. Then, to solve the second problem, a comparison should be made of the results of these tests with scores from other representative colleges and universities of the two races in the section tested. Two obstacles interfere with this. In the first place, a comparison of the educational standards and equipment of the white and negro schools would need to be made. Few negro schools can yet compare at all favorably with representative white schools of this section, in spite of the improvement during the last 25 years in the negro institutions. Also, although it is more difficult to obtain than the preceding data, we must secure samplings from other negro schools to check the Fisk results. At present, this is made practically impossible by the general reluctance of negro schools and their administrators to use psychological tests and publish the conclusions. The opportunity to make this study at Fisk was most unusual. When such data as would check this sampling were requested from other negro colleges, test scores in sufficient number could not be obtained nor was permission granted to give the tests.² Thus, the question of the relative representativeness of the Fisk group cannot yet be answered.

²Peterson's medians for adult negro students in the Agricultural and Industrial Normal College at Nashville in the Otis, Myers, and Atkinson tests are considerably lower than those obtained at Fisk.

Also, Wilkerson, of Virginia Normal and Industrial Institute, furnished the I.B. frequency distributions in the Otis Group Intelligence Scale for 155

RESULTS OF THE TESTS

The results from this comparison of the rational responses of negro and white college students are presented in two tables, comparison in Table 2 being based upon medians and in Table 3 upon percentiles. The existence of a true difference between the medians of the two races is considered statistically reliable if the quotient of the critical ratio³ is as high as 4. This is usually interpreted to mean a theoretical chance of only about 3 in 1000 that, in any future testing of similar groups, the direction of the difference would be reversed. Judged by this standard, only one of the differences between the medians is reliable. This is in the Otis test and is in favor of the whites. Three other tests, however, have quotients which, though not reliable by the above criterion, are large enough to suggest a true difference. These are the Atkinson, with a quotient of 3.1; the Rational Learning, with 3.8; and the Army Alpha, with 3.3, the difference in every case being in favor of the white group.

It is important to note that the white students excel more frequently than do the negroes. Even though only one of the differences is statistically reliable by the criterion mentioned, an actual superiority is demonstrated when differences are disproportionately in one direction. In this case out of 9 tests, the differences are favorable to the whites in 7. The median quotient of the 9 critical ratios is 2.0. Reading from a table in Garrett's *Statistics in Psychology and Education*, page 135, we find that the probability of a true difference greater than zero for this quotient is 91 chances out of a hundred. This represents the median white's chances of excelling in any one test. If, then, we apply the mathematical theory of probability to a battery of 9 or more tests, we perceive that the median negro's chances of excelling in all or even a majority of the tests will be represented by such a disproportion as to be, for all practical purposes, beyond determination by mere chance.

entering students. When these are reduced to comparable score units in the Otis Self-Administering test, they show that the difference between the medians is statistically reliable and that the Fisk group is higher. In the scale of I.B., the median is 93; Q_1 is 73; and Q_3 is 113. The amount of the difference in P.E. units of the Fisk distribution is 1.37, and the difference in medians divided by the P.E. of the difference is 9.9. Both these investigations tend to show that the Fisk sampling is quite superior, but the data are decidedly insufficient to prove the case.

³For the formula of the critical ratio, see the footnote to Table 2.

TABLE 2
A COMPARISON OF WHITE AND NEGRO ABILITIES IN THE TESTS BASED UPON
THE MEDIANS

Test	Race	Cases	Median	Q	Diff. in medians Diff.	P.E. diff. Diff.	Q _w	Lap. Md.	Diff. favors
Otis (20m)	W	126	42.4	6.1	4.1	4.8	.68	67	W
	N	181	38.3	5.9				28	
Army Alpha	W	108	127.6	16.4	9.3	3.3	.57	69	W
	N	120	118.3	17.3				36	
Myers Mental Measure	W	106	75.4	10.8	9.2	.6	.86	74	W
	N	168	66.2	10.4				30	
Binet Group	W	115	35.5	3.0				43	
	N	99	36.2	3.5	.7	1.3	.24	55	N
Hard Opposites	W	274	106.7	28.8	8.8	2.0	.30	58	W
	N	187	97.9	42.3				45	
Word Building	W	130	20.3	3.2				43	
	N	108	21.0	2.3	.7	1.6	.23	57	N
Atkinson	W	100	12.8	3.9	2.0	3.1	.51	62	W
	N	100	10.8	3.4				33	
Mixed Relations	W	67	52.1	18.6	6.0	1.9	.32	57	W
	N	108	46.1	14.2				40	
Rational Learning	W	100	60.6	23.2	13.9	3.8	.60	66	W
	N	100	46.7	18.3				30	

The key to the symbols used in Table 2 is as follows: W means the white, and N the negro race; Q is the quartile deviation or one-half of the distance between the 75th and 25th percentile points in the given distribution; Diff./P.E. is derived from the following formulas:

$$\text{P.E. (md)} = \frac{5}{4} \frac{\text{Q}_{\text{diff.}}}{\sqrt{N}} \quad \text{and} \quad \text{P.E.}_{\text{diff.}} = \sqrt{\frac{\text{P.E.}^1}{(\text{Md}_1)} + \frac{\text{P.E.}^2}{(\text{Md}_2)}}$$

and gives a critical ratio which, if the quotient is as high as 4, shows statistical reliability of the difference obtained; Diff./Q_w gives the size of the difference of medians in a standard unit and makes inter-test comparison possible in independence of the size of score units; Lap. Md. means the percentage of one group surpassing the median of the other group; Diff. favors means that the difference is favorable to the group indicated. The formula deriving the probable error from the quartile deviation is more conservative than one derived from σ . Hence, the use of the other formula would have made this critical ratio somewhat higher.

Combined values for the Mixed Relations and the Rational Learning were obtained by the percentile method. In the Mixed Relations test, time and number right were thus combined, and in the Rational Learning, time, repetitions, and total errors. The distributions were obtained by assigning the appropriate percentile ranking of the white distributions to each individual score for time, repetitions, and total errors and by averaging these elements. The percentiles in Table 3 give the real scores for the various elements,

and a further comparison of the classes of error in the Rational Learning will soon appear in a second article entitled, "A Quantitative Comparison of Certain Mental Traits of Negro and White College Students."

These statistical computations are based upon medians and Q's carried out to the nearest hundredth, but are recorded here only to the nearest tenth.

TABLE 3
A PERCENTILE COMPARISON OF WHITE AND NEGRO ABILITIES

Percent-iles	Otis (20m)		Army		Alpha		Myers		M.M. Binet		Group Opposites	
	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro
100	64.0	63.0	176.0	183.0	119.0	99.0	48.0	48.0	297.0	282.0		
95	58.8	52.0	168.9	168.0	103.4	90.1	44.4	45.3	198.3	200.6		
90	53.2	50.0	157.9	154.7	95.7	86.0	42.5	43.3	178.0	190.4		
80	49.7	45.4	150.2	141.6	89.9	78.6	39.7	39.9	149.1	150.4		
75	48.3	43.3	144.0	136.8	86.7	76.7	38.7	39.4	136.6	140.3		
70	47.1	41.8	141.4	132.6	83.2	74.3	37.8	38.6	128.2	126.1		
60	44.7	39.2	136.0	125.1	80.4	70.8	36.6	37.3	116.0	112.7		
50	42.4	38.3	127.6	118.3	75.4	66.2	35.5	36.2	106.7	97.9		
40	40.2	35.2	123.2	111.4	70.7	61.9	34.5	34.9	95.6	80.8		
30	37.5	32.9	117.0	105.0	67.4	57.7	33.4	33.3	84.7	71.5		
25	36.1	31.6	111.3	101.1	65.1	56.0	32.7	32.4	79.0	55.6		
20	34.4	30.2	107.3	96.1	62.6	52.9	32.0	30.9	73.3	50.3		
10	30.8	26.7	88.9	85.4	57.6	45.2	28.5	29.5	58.4	47.1		
5	28.5	20.3	82.6	70.0	51.0	40.6	25.1	28.2	45.2	31.0		
0	12.0	0.0	56.0	55.0	44.0	14.0	20.0	20.0	25.0	1.0		

Percent-iles	Word bldg.		Atkinson		Mixed relations		Time in seconds	
	White	Negro	White	Negro	Score	Score	White	Negro
100	32.0	30.0	24.0	20.0	20.0	20.0	60.0	45.0
95	27.9	28.0	18.3	17.0	20.0	19.8	81.1	71.5
90	26.3	26.6	17.3	16.2	19.9	19.6	83.9	77.5
80	23.6	24.7	15.7	14.8	19.6	19.1	85.0	86.0
75	23.0	23.7	15.3	13.9	19.4	18.9	92.8	89.8
70	22.4	23.0	14.9	13.3	19.3	18.8	96.1	83.6
60	21.3	21.7	13.9	11.7	19.0	18.5	107.0	101.8
50	20.3	21.0	12.8	10.8	18.7	17.8	121.6	112.3
40	19.1	20.1	11.2	9.2	18.3	17.3	129.0	121.3
30	17.6	18.4	9.4	8.0	18.0	16.4	137.4	127.6
25	16.7	18.2	7.5	7.2	17.7	16.0	143.1	131.3
20	15.8	17.0	6.0	5.3	17.2	15.4	162.0	136.6
10	13.1	14.7	3.5	3.0	15.4	13.5	186.5	166.5
5	11.0	12.0	2.6	1.8	10.6	10.9	196.5	181.3
0	4.0	5.0	0.0	0.0	2.0	6.0	220.0	313.0

TABLE 3 (cont.)

Percent- iles	Time in minutes		Rational learning Repetitions		Total errors	
	White	Negro	White	Negro	White	Negro
100	6.0	8.0	5.0	4.0	36	38
95	8.7	10.5	6.8	6.0	60	80
90	10.5	11.7	7.5	8.0	76	101
80	12.2	16.8	9.4	9.9	114	132
75	13.3	17.5	10.5	11.0	129	150
70	14.5	18.7	11.1	11.5	143	163
60	15.7	20.5	12.2	12.9	190	235
50	18.7	22.5	12.9	14.2	224	270
40	20.6	25.0	14.3	15.4	271	310
30	22.6	27.6	16.3	16.1	330	360
25	24.5	28.0	17.3	17.7	378	393
20	26.7	31.5	18.3	19.0	439	425
10	34.0	35.5	21.0	24.5	532	540
5	40.0	46.0	25.0	27.0	759	671
0	60.0	89.0	33.0	35.0	1160	1804

We are next interested in the amount of negro deficiency. By stating the difference between the two medians in terms of probable error units of the white distribution, we have a measure which makes inter-test comparison possible. We might, then, let the median of these nine measures represent the amount of negro deficiency in the entire battery of tests. This method is open to the objections that the tests are treated as of equal weight, and that they are held to reflect equally environmental influences and to be equally valid measures of intelligence. This we cannot support. Hence, without claiming any strict reliability for the method, we give it as a rather crude way of expressing in a single measure the probable amount of negro deficiency. For the nine tests, the range of the difference is from .86, favoring the whites, to .24 favoring the negroes, with a median of .51 in favor of the whites. If the amount of the white superiority is reckoned by this median, it amounts in a normal distribution to the inclusion of 13% of the white group between the white and negro medians. This indicates that 63% of the white group surpass the median of the negroes. If, similarly, we adopt this method of comparison for the percentage of overlapping of the respective medians by the opposite group and select the median amount of overlapping as a true measure of the difference, we observe that the median of the nine percentages of overlapping for the

negro group is 36, and for the whites it is 62. Evidently, in the kind of tests used, 36 or 37% of negro college students reach the white median.⁴ As a review of Table 1 will indicate, no other investigation shows such small differences. According to Joseph Peterson's evaluation of many of these race studies, only 15 to 18% of the negroes reach the white median, and, according to others, only 12 to 25%.

The percentile tables as a supplement to the comparison based on medians are included for three reasons other than the giving of more complete data: (1) to avoid the danger of regarding each group as huddled closely around its median; (2) to observe in the case of skewed data the relative standing of the low and of the high percentiles in both races; and (3) to note the upper limit of each race.

The percentiles indicate an extended range in the scores made by each race and a rather continuous distribution over this range. In the Army Alpha, for example, the range of the whites is about 69, or from 89 to 158, even when we eliminate the extreme upper and lower 10%, and for the negroes, it is 70, or from 85 to 155; while the difference between the respective medians is only 9.3. In using averages alone, the danger is that we are prone to overlook the spread of the individual scores, to let the average stand for the dead level of all, and to label them accordingly as superior or inferior. A negro deficiency of .57 Q_w , indicating in a normal distribution that about 64% of the whites equal or pass the negro median, is noted in Table 2; and in Table 3 we see that one negro scored higher than the highest white tested.

The percentile table also gives a general conception of the skewness of groups and tests. Not all the tests are alike in difficulty.⁵

⁴Among those tests in which the differential critical ratio is over 3, we find the Otis, Alpha, Atkinson, and Rational Learning tests. These differences are .68, .57, .51, and .60 Q_w , respectively, with a median of .59 or .08 Q_w higher than for the median of the 9 tests. For these 4 tests, the percentage of negro overlapping of the white median is about 32, or 4 or 5% lower than for the median of the entire 9. Either the negroes rate a little lower in these 4 tests, which are probably the better indicators of innate intelligence, or, the white sampling may be a somewhat higher group. Note that the students from Peabody College are largely represented here.

⁵The lack of equality in score units in some tests needs notice. For example, in the Rational Learning test, a difference of 10 errors between a total of 30 and 40 and a similar difference of 10 between 1200 and 1210 are not comparable.

One that is hard tends to bunch the poorer students among the low marks and to make the better students well scattered and spread out, while an easy test is likely to give a well-spread tail toward the lower end and to gather the better students together at the upper end. The Mixed Relations, in which the extreme range for the upper quartile of the whites is .6 of a score unit and for the lower quartile is 15.7, or the Directions tests, omitted from Table 2 because 75% of the whites and 60% of the negroes made perfect scores, are useful only for the comparison of the lower scores in each distribution. The low negro scores are both more numerous and spread more gradually and uniformly. On the other hand, in a difficult test like the Hard Opposites, we perceive in the upper quartile of the whites that the range is 137 units and in the lower quartile is only 54. The upper fourth of the negroes compares most favorably with the same fourth of whites in this difficult test.

Thorndike (68) states that "in many practical matters, the upper limit of a group is as important as its average or typical status." Particularly is this true in the case of groups which are already selected through various school and economic processes and which are in training for specialized and expert service to society. Consider the relative positions of the two racial groups at the 90, 95, and 100 percentiles. In the Binet group scale, Hard Opposites, and Word Building, the negro percentile scores equal those of the whites. In the other tests, with two exceptions, the 90 percentile score of the negroes is above the 80 percentile of the whites. The exceptions are the combined score of the Rational Learning, in which the negro 90 percentile lies between the white 75 and 80, and the Myers, in which it stands between the 50 and 60 percentile. The white upper limit is, on the whole, only slightly higher than the upper limit of the negroes. This upper limit of the negroes is notably higher than that reported in Thorndike's investigation (68) in which less than 4% of the negroes passed the white median. The obvious explanation to harmonize this difference, an assertion that the Fisk sampling was relatively much more highly selected than the corresponding white sampling, is insufficiently supported by objective data. Some credability is given to the view by considering the upper fourth of the negroes in the difficult Hard Opposite test, but the poor intellectual caliber of the lower fourth is also to be noted in the easy Mixed Relations test.

Recent Chicago and Stanford studies into the effect of environment upon the I. Q., as measured by intelligence test scores, indicate that an improvement in environment does produce a gain in the I. Q. Miss Burks reports (10) that "the total contribution of heredity is probably not far from 75 to 80 percent," that "the home environment contributes about 17 percent of the variance in I. Q.," that "measurable environment one standard deviation above or below the mean of the population does not shift the I. Q. by more than 6 to 9 points above or below the value it would have had under normal environmental conditions," and that "the maximal contribution of the best home environment to intelligence is about 20 I. Q. points, or less, and almost surely lies between 10 and 30 points. But situations as extreme as either of these probably occur only once in a thousand times in American communities." Findings of this sort, which tend to indicate a significant environmental influence upon intelligence test scores, suggest added caution in the interpretation of results obtained from individuals with unequal social surroundings. The cultural environment of the American negro is modeled after the same social pattern as that of the whites, seems as stable, and has for the most part the same national background. Nevertheless, it is less stimulating than is that of the whites. It has for its foundation an inferior social status. The hopelessness of receiving equal professional opportunity or recognition or encouragement is obvious. To what extent these differences in environmental patterns vitiate the above results, which are favorable to the whites, is perhaps suggested by the Burks and Freeman (17) studies; but, inversely, to what degree a different social environment operates as a selective factor so that only the very ablest of the race are in college preparing for this unequal competition is another question which demands additional study. Further investigations are needed in which the social surroundings are more nearly equal in their stimulating influence. This may be possible in a place like Jamaica, where skin color is much less of a factor than it is in the United States for opening or closing social, educational, or business opportunities. Also, more tests like the Rational Learning should be employed, which are less sensitive than are the usual group tests to environmental and educational acquisitions. Leaving unsolved here the questions of how much the difference between the races is innate or how much due

to the more stimulating white milieu, the results reached in this study indicate that about 36 to 37% of this negro college student group reach or surpass the median intelligence test scores of the tested white students.

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UNE COMPARAISON QUANTITATIVE DES RÉPONSES RATIONNELLES DES ÉTUDIANTS NEGRES ET BLANCS DANS LE "COLLÈGE"

(Résumé)

Bien que l'on ne puisse trouver directement une seule mesure moyenne quand on compare les résultats des études antérieures de la capacité mentale des nègres et des blancs, le résumé de ces études montre que le pourcentage probable des nègres qui arrivent au médiane des blancs est entre 12 et 25 pour cent. Cette étude-ci des adultes les plus intelligents des deux groupes, choisis parmi les étudiants matriculés dans les "collèges" et les universités du sud des Etats-Unis, montre une plus petite inégalité. On a fait subir 9 tests d'intelligence à de 99 à 187 "collégiens" nègres et à un groupe à peu près égal de blancs. Pour rendre possible la comparaison des tests, on a computed la différence entre les médianes de chaque test en termes des unités des erreurs probables de la distribution des blancs. On a obtenu une sorte de mesure de l'insuffisance des nègres en employant le médiane de ces 9 mesures, c'est-à-dire, 0, 51 des unités des erreurs probables de la distribution des blancs. Pour une distribution normale, cela fait inclure environ 13% du groupe des blancs entre le médiane des blancs et celui des nègres. Sans essayer de constater si la différence est due aux facteurs innés ou au milieu stimulant des blancs, on conclut que d'environ 36 à 37 pour cent

de ce groupe de nègres égale ou surpasse les résultats médianes des tests d'intelligence subis par les étudiants blancs.

GRAHAM

EIN QUANTITATIVER VERGLEICH RATIONELLER ANTWORTEN VON WEISSEN UND FARBIGEN COLLEGE STUDENTEN

(Referat)

Obleich ein Inter-Test Vergleich führender Untersuchungen über die geistige Befähigung von Negeren und Weissen nicht direkt zu einem einzigen Durchschnittsmass reduziert werden kann, so zeigt doch eine Zusammenstellung dieser Studien, dass der wahrscheinliche Prozentsatz der Neger, welcher das Durchschnittsmass der Weissen erreichen irgendwo zwischen 12 und 25% liegen muss. Diese Untersuchung der fähigeren Erwachsenen beider Gruppen, ausgewählt aus dem Namensverzeichnis der Colleges und Universitäten der Südstaaten der Union, zeigt eine geringere Ungleichheit. 9 Tests geistiger Befähigung wurden 99 bis 187 farbigen College Studenten gegeben und ebenfalls einer fast gleichen Anzahl weisser Studenten. Um einen Inter-Test Vergleich zu ermöglichen, berechnete man den Unterschied zwischen den Mitteln in jedem Test in der Form der wahrscheinlichen Irrtumseinheiten der Verteilung der Weissen. Eine einzige Messung der Unzlänglichkeit der Neger erhielt man durch die Mittel der 9 Bemessungen, nämlich .51 wahrscheinliche Irrtumseinheiten der Verteilung der Weissen. Dies bedeutet, bei normaler Verteilung die Einschiebung von etwa 13% der weissen Gruppe zwischen die Mittel der weissen und der farbigen Gruppen. Abgesehen von der Frage ob dieser Unterschied die Folge angeborener Anlage oder des günstigeren, anregenderen Milieus ist —die Schlussfolgerung ist, dass ungefähr 36 bis 37% dieser Neger Studenten Gruppe die Mittelwertungen der Intelligenz Tests der geprüften weissen Studenten entweder erreicht oder übertrifft.

GRAHAM

AN OBJECTIVITY-SUBJECTIVITY RATIO FOR SCALES OF MEASUREMENT*

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Test practitioners insist that their tests are objective, yet they fail to tell what objectivity is, or how and why their tests are objective. Logically the burden of proof rests with them, but the only proof they furnish consists of repetition and reiteration. Because of this situation, it is interesting to examine these claims to objectivity and to see what is really meant.

In the most usual meaning of the word, objective denotes the physical as subjective does the mental. In this sense, a test is clearly objective. But so also is the old style of "subjective" examination. Therefore, the term objective cannot be used in this connection in the merely physical sense.

Possibly there is confusion between objective scale and objective record, a mistake very easy to make. Scholastic records as filed in the recorder's office are illustrative of the objective record, yet few would assert, especially if the old style examination had been used, that the scale was objective.

More pertinent, perhaps, are the considerations brought out by the psychophysical techniques. Any factor or factors which may influence the judgment, except the one being investigated, must be ruled out through rigorously controlled conditions. The time error, the space error, the absolute impression, habituation, expectation, the recognition of material which may lead to the use of memory rather than discrimination, the interpretations involved when two or more qualities vary simultaneously, the emotional values which may attach to one or the other of the objects compared—all of these constitute sources of error. In turn, all of these sources of error are human, psychical, and, in that sense, subjective. If the scale can be freed from such subjective influences, it will automatically become more objective. In other words, the greater the extent to which the scale

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can be freed from the "human" element, the more objective it becomes.

The easiest solution is of course to use a non-human scale, such as a yard stick or a balance. These implements are extremely insensitive to the influences mentioned above as constituting the sources of subjectivity. Mental and personality tests are apparently parodies of such inert scales and have sprung into being as the result of an effort to avoid the difficulties inherent in the human measuring scale. Possibly it is in this sense that their claim to objectivity lies.

If their use reduces the *human* errors to the same extent that physical scales do, they may be considered to be as objective as the physical scales. The question is whether they do squeeze out the human errors with this degree of completeness.

To answer this question, some technique must be used for determining, with a high degree of accuracy, the relative amounts of objectivity and of subjectivity inherent in the scale. The following methods have been suggested.

Laird (2) says: "The measure or test is objective only when different users apply it to the same persons and the scores or measures obtained are practically identical. It is subjective when Mr. A and Mr. B get different results when testing Mr. Jones. Jones has the same abilities and capacities regardless of who is testing or examining him. If these examiners do not agree, it is evident that one or the other, or both, is not making a true measure of the person under observation" (pp. 83-84).

Substitute the word yard-stick for test, and objects for persons, and the parallel with physical measurements is sufficiently obvious. The analogy is perhaps sound if the person measured is really a constant. But he is not. Consequently, Laird's technique measures two simultaneous variables, the subjectivity of the measurer and the variability of the thing measured. It is, therefore, of little value for our purpose.

A second technique is suggested by Slawson (3). He contributes the idea that the greater the agreement between subjects, the more objective the scale. It should follow then that a test involving only addition of a simple sort would, with college students, show a high agreement between subjects. Make the problems 10 times as long, and the agreement between subjects would be very slight. Since the same process is tested by the two procedures, one should be as objec-

tive as the other. The objectivity should not be changed by the length of the problem alone, for that would be equivalent to making an inch objective and a yard subjective.

A third suggestion is contributed by Thorndike (4). He says: "What science means by a perfectly 'objective' scale is a scale in respect to whose meaning all competent thinkers agree. A perfectly 'subjective' scale is one in respect to whose meaning all competent thinkers disagree (save by chance). These are the limits between which the actual scales known to science lie" (pp. 7-13).

If Thorndike means, as probably he does not, agreement between subjects, his dictum reduces to Slawson's and the objection is the same. On the other hand, if he means that the objective is a single standard scale and the subjective a multistandard one, his definition is sufficiently accurate to differentiate them. Unfortunately, he gives no technique for determining objectivity in the latter sense. In short, all of the suggestions for criteria of objectivity fail to provide a technique which will measure it.

Wells (5) approaches the problem from a new angle. He divided his subjects into two equal groups. Group A repeated the experiment several times, Group B performed it only once. By combining the first record of each member of Group A and those of Group B an average deviation may be determined which will show the variability in the records of the different individuals. Similarly, by computing the average deviation for the repeated tests on Group A, the variability of the same individual may be obtained. By comparing the variability of the individual on the repeated test with the variability of several individuals who are tested once each, an index may be derived which will indicate the amount of subjectivity.

This procedure is a step in the right direction, but one factor of great importance is neglected. To make the results meaningful, we must know that the average deviations can be compared. Greater skill in one group than in the other, whether natural, or acquired through practice, would vitiate the comparison of dispersions. Consequently, some method of avoiding this difficulty is necessary.

Hollingworth (1) takes another forward stride. Instead of using the average deviation method of Wells, he resorts to rank difference correlations. The same subject performs the experiment twice, thus giving two series of ranks. These are correlated to

give a personal consistency. The personal consistencies of all subjects are then averaged. This gives the first term. To obtain the second term, each ranking is correlated with the rank order determined by the concensus of opinion. This may be termed an accuracy correlation. Subjectivity is obtained by dividing personal consistency by accuracy.

The drawback to this method is that again a comparison is made between factors which are not strictly comparable. The average of a series of ratings is presumably more valid than the single ratings. Consequently the comparison of two single ratings should be, on the average, less than the correlation between the single rating and the rank determined by the pool of all the ratings.

The problem of objectivity is worth solving, and it should permit of experimental solution. If a number of admittedly objective scales¹ are used, the data, upon analysis, may reveal a number of constant and uniform trends. If a number of admittedly subjective scales are used with as nearly as possible identical technique and method, the data may reveal a number of constant and uniform trends. Should the trends be the same for both objective and subjective scales, the results will mean little. On the other hand, if certain trends hold consistently for objective, but not for subjective, scales, these differences may be taken as distinguishing marks. The relations which hold constant for objective, but not for subjective, scales become distinguishing features of objective scales. Similarly, the relations which hold for subjective, but not for objective, scales become the criteria of subjectivity.

EXPERIMENTS WITH OBJECTIVE SCALES

The objective scales were selected from the standpoint of ease of control of experimental conditions. Those used were weight, length, area, and number. Since an identical technique was maintained in all of the experiments, a brief description of the method will save much repetition.

Throughout, the method of rank differences was used. In every case, unless otherwise noted, 10 samples, constituting one series, were arranged in order of merit by each subject. At a subsequent time,

¹"Scales in respect to whose meaning competent thinkers could agree rather closely were early devised in the case of number, time, length, and weight" (4, p. 13).

varying from 5 minutes to 3 weeks, the same subject made a second arrangement of the same series. Consequently, it is possible to correlate, for each subject, the first order for each series with the second order for the same series. The value thus obtained, one form of the "reliability coefficient," is called *self consistency*, and shows how closely the same person agrees with himself when doing the same task twice. Similarly, it is possible to correlate the positions assigned by each subject in a given series with those assigned by all other subjects. This value, expressed as an average, is known as *group consistency*. In actual practice, group consistency was determined by a sampling method, whereby the ranks assigned by each subject were correlated with those assigned by two other subjects.²

The experimental material consisted of the following parts:

Experiment 1. Five series of 10 pill boxes were used, each loaded with shot and cotton so that the weights in each series increased by "compound interest." In series 1, the increment was $1/20$; in series 2, $1/30$; in series 3, $1/40$; in series 4, $1/50$; in series 5, $1/60$. One hundred ten subjects were used in this experiment.

Experiment 2. Five series of lines drawn on white card board, the length increasing by "compound interest." The fifth line in each series was 100 mm. long. In series 1, the increment was $1/48$; in series 2, $1/78$; in series 3, $1/92$; in series 4, $1/129$; in series 5, $1/158$. Seventy subjects were used.

Experiment 3. Five series of circles were drawn on white card board, the areas increasing by a geometrical ratio. Each circle had a diameter one-half the length of the corresponding line in the corresponding series of lines used in Experiment 2. For series 1, the increment of difference was $1/22$; in series 2, $1/32$; in series 3, $1/48$; in series 4, $1/69$; in series 5, $1/78$. Seventy subjects were used, the same as those employed in the second experiment.

Experiment 4. Five series of cards were made, each containing 100 letters, x and o, arranged in chance order. The task was to discriminate the relative number of x's on the 10 cards of each series.

²Accuracy correlations were also computed by correlating the assigned order against the true order. It was found, when consensus of opinion agreed with the actual order, that the accuracy correlations when averaged were the square roots of the corresponding group consistency correlations. Since this relation has a direct bearing upon the validity of scales, the presentation of the evidence will be postponed for discussion in a later paper.

The first card of each series contained 50 x's. In series 1, there was a constant increase of 1 x to each succeeding card; in series 2, 2 x's increase; in series 3, 3 x's; in series 4, 4 x's; and in series 5, 5 x's. Thirty-one subjects were tested.

Experiment 5. The material consisted of 10 series of 10 lines each. The increase of length was in terms of simple rather than compound interest. The fifth line of each series was 100 mm. long. In series 1, the difference between contiguous lines was 5 mm.; in series 2, 4 mm.; in series 3, 3 mm.; in series 4, 2 mm.; in series 5, 1 mm.; in series 6, $1/2$ mm.; in series 7, $1/4$ mm.; in series 8, 0 mm.; in series 9, 7 mm.; and in series 10, 6 mm. The results of series 8, in which there were no differences in length, are not included in the records which follow. Thirty-four subjects were used.

Experiment 6. The material consisted of 10 series of 10 circles each. They exactly paralleled the material in Experiment 5, each circle having a diameter one-half the length of the corresponding line in the corresponding series. Thirty-four subjects were tested.

Experiment 7. The material consisted of 10 series of 10 triangles each. They exactly paralleled the material in Experiment 6, each triangle having sides equal to the diameter of the corresponding circle in the corresponding series. Thirty-four subjects were employed.

These 7 experiments provide opportunity for making 47 comparisons, a number sufficiently large to guard against coincidence and chance. The probable errors have all been computed, but will be omitted to make the tables less cumbersome. They range from .003 to .06, the smaller values going with large discriminable differences, the large values with the small differences.

The results have been worked through from a variety of angles. Many interesting relations have been discovered, most of which are not germane to the purpose of this paper. The most significant ones as pertaining to objectivity are the self-consistency and the group-consistency values. The discussion will consequently be limited to them. In Table 1 is given the following information: in columns 1 and 2, two samples of group consistency; in column 3, the self consistency; in columns 4 and 5, the ratio obtained by dividing self consistency by group consistency.

The evidence, as summarized in the table, is sufficiently clear cut and definite to show, when objective scales are employed by the meth-

TABLE 1

		G. C. ₁	G. C. ₂	S. C.	Ratio ₁	Ratio ₂	
Weights	1	.716	.703	.722	.993	.975	
	2	.572	.568	.573	.998	.992	
	3	.401	.409	.402	.999	1.018	
	4	.261	.254	.297	.879	.855	
	5	.201	.193	.166	1.210	1.163	1.008
Lines	1	.857	.855	.849	1.008	1.006	
	2	.748	.739	.757	.988	.976	
	3	.609	.619	.632	.963	.979	
	4	.489	.469	.530	.923	.886	
	5	.403	.409	.473	.853	.867	.945
Areas	1	.917	.919	.919	.099	1.000	
	2	.885	.883	.878	1.008	1.006	
	3	.843	.847	.851	.992	.995	
	4	.758	.731	.733	1.035	.998	
	5	.643	.635	.626	1.028	1.014	1.008
Numbers	1	.380	.296	.305	1.246	.971	
	2	.367	.364	.423	.868	.862	
	3	.454	.458	.504	.902	.911	
	4	.740	.754	.713	1.038	1.057	
	5	.786	.802	.838	.940	.958	.975
Areas ₂	1	.996	.996	.996	1.000	1.000	
	2	.986	.986	.988	.998	.998	
	3	.961	.955	.956	1.006	.999	
	4	.911	.898	.886	1.029	1.016	
	5	.708	.728	.711	.995	1.025	
	6	.384	.318	.411	.935	.775	
	7	.123	.146	.121	1.017	1.209	
	9	.998	.998	.998	1.000	1.000	
	10	1.000	1.000	1.000	1.000	1.000	1.000
Areas ₃	1	.994	.994	.993	1.001	1.001	
	2	.989	.989	.989	1.000	1.000	
	3	.955	.958	.965	.988	.992	
	4	.884	.890	.901	.981	.988	
	5	.598	.601	.649	.925	.927	
	6	.189	.236	.234	.810	1.008	
	7	.110	.128	.101	1.088	1.267	
	9	.993	.993	.993	1.000	1.000	
	10	.997	.996	.997	1.000	.999	.999
Lines ₂	1	.995	.995	.995	1.000	1.000	
	2	.979	.955	.978	1.001	.977	
	3	.983	.983	.985	.998	.998	
	4	.941	.933	.928	1.014	1.004	
	5	.723	.765	.782	.924	.978	
	6	.372	.363	.446	.834	.815	
	7	.214	.197	.168	1.261	1.172	
	9	.997	.997	.997	1.000	1.000	
	10	.996	.996	.996	1.000	1.000	.999
Average		.702	.700	.710	.993	.992	.991

od discribed above, that self consistency and group consistency are approximately equal. The average group consistency is .701, the average self consistency is .710. The difference of .009 is too small to be significant. Likewise, the average of the ratios is .9925. The median value of the ratios lies in the 1.00 group, the quartiles in the .98 and 1.01 groups, respectively. The probable error is approximately .003. Between 1.02 and .98, inclusive, are found 62% of all the ratios. Of the remaining 38%, 25% of the total, or 66% of the 38%, are found in those cases where the differences to be judged were subliminal, and are consequently due to inadequate sampling.

Our conclusion is that when objective scales are employed in such a way as to avoid the constant errors brought to light by the psychophysical techniques, self consistency and group consistency are equal inside the limits of error imposed by the experimental procedure. This is equivalent to saying that objectivity excludes the appearance of constant errors, while admitting random or chance errors.

This point may be illustrated by cards. If we take 10 clubs and 10 diamonds, the ace to the 10 spot, shuffle the clubs, and deal them off, recording the value of the spots as they appear, then repeat the procedure with the clubs a second time, the correlation between the two orders may be called the self consistency. Similarly, two orders thus obtained from the diamonds when correlated will give a second measure of self consistency. A comparison of the orders for the diamonds and clubs will give group consistency. Repeat until an adequate sampling has been obtained. This is a limiting case, where self consistency and group consistency should both equal 0, and therefore be equal to each other. To enable us to get positive correlations, a modification of this procedure was employed. The cards were divided into two equal groups for each suit, ace to 5 spot constituting one group; 6 to 10, the other. They were shuffled independently, the cards in the first group assigned to the first 5 places, those in the second group to the second 5 places. In this way series of ranks were obtained which should give positive consistency correlations equalling .77. Twenty samples gave a self consistency of .76 and a group consistency of .77, or an objectivity ratio of 1.01. This may be taken to mean that when only chance errors are involved, self consistency and group consistency are equal.

EXPERIMENTS WITH SUBJECTIVE SCALES

The subjective scales used for study included personality ratings, advertising appeals, and evaluations of interest.

The personality ratings were obtained from groups of 10 women who were sufficiently well acquainted with one another to have valid impressions. The average values for 12 such teams were used for each of the 15 traits discussed. As before, the method of rank differences was used. Each rater ranked the entire group of 10 twice on each trait. The average time separating the rankings was 3 weeks.

Of the advertising appeals there were 3 sets. One set consisted of 10 advertisements selected from Hollingworth's list of 50, odd-numbered advertisements, approximately equally spaced from 1 to 49, being used. The second set consisted of the even-numbered advertisements from 2 to 50. The third set was composed of 10 classified advertisements for salesmen. All were arranged in order of merit by 50 subjects with an interval of 2 weeks between the successive arrangements.

The material for the experiment on interest was a set of 12 pictures obtained from current advertisements, the main appeal of each picture being one of the following: children, beauty, sports, travel, love, adventure, power, tragedy, comfort, sex, humor, and food. The 12 pictures were arranged in order of merit of interest by 40 subjects. One week later, the same subjects arranged the same set of pictures a second time. The following week, a second set of pictures carrying the same appeals were arranged by the same 40 subjects. The fourth week, the experiment of the third week was repeated.

The results obtained from these experiments are shown in Table 2.

The evidence here is even more striking than it was in the case of the objective scales. For, when subjective scales are employed experimentally with the same technique and method as that employed with the objective scales, a constant trend is discovered. This trend is different from that discovered by the analysis of the results obtained by objective scales. With subjective scales, self consistency is invariably greater than group consistency. The ratio obtained by dividing group consistency by self consistency is invariably less than 1.00.

That self consistency is greater than group consistency without

TABLE 2

Ratings	G. C. ₁	G. C. ₂	S. C.	Ratio	Ratio
Industry	.451	.442	.707	.637	.625
Steady worker	.548	.532	.765	.717	.696
Procrastination	.336	.343	.555	.605	.618
Give up easily	.329	.331	.525	.627	.630
Obstinacy	.311	.254	.572	.543	.444
Impulsiveness	.358	.352	.662	.541	.532
Emotional	.349	.322	.644	.543	.501
Touchy	.285	.271	.582	.489	.466
Easily led	.319	.256	.572	.558	.448
Easily led	.297	.276	.625	.475	.442
Joyful	.390	.356	.684	.570	.521
Mentally quick	.310	.320	.636	.487	.504
Popularity	.418	.438	.737	.567	.595
Strength of will	.201	.235	.567	.354	.415
Tolerance	.329	.295	.688	.478	.429
Mean	.348	.335	.635	.546	.524
Interest <i>a</i>	.226		.810	.279	
Interest <i>b</i>	.276		.820	.337	
Mean	.251		.815	.308	
Advertisements <i>a</i>	.138		.687	.201	
Advertisements <i>b</i>	.150		.691	.217	
Advertisements <i>c</i>	.129		.573	.226	
Mean	.139		.650	.215	

any exception is an indication of the presence of a factor or factors which make the individual resemble himself more closely than he does the group. It seems probable that these factors deserve the name of constant errors, and that they are superimposed on the random errors which we found to exist in the analysis of the objective scales.

That constant errors will produce the effect described immediately above is shown by a modification of the card-dealing experiment. If, instead of shuffling the 5 cards in each half of the group of 10, one in each half is kept constant in all the dealing representing group consistency for a single subject, but its position and value changed from subject to subject, we obtain a group consistency of .774 and a self consistency of .843. This gives an objectivity ratio of .916, and shows that the arbitrary introduction of constant errors for the individual, which are for the group variable errors, will introduce "subjectivity" into the ratio.

It would seem, from the evidence presented, that the group con-

TABLE 3

Series	Number pooled	Lines			Circles		
		S.C.	G.C.	Ratio	S.C.	G.C.	Ratio
1	1	.849	.856	1.008	.919	.918	.999
	7	.984	.985	1.001	.992	.992	1.000
	14	.994	.994	1.000	.998	.998	1.000
	21	.990	.990	1.000	.996	.996	1.000
	28	.995	.995	1.000	1.000	1.000	1.000
	35	1.000	1.000	1.000	1.000	1.000	1.000
2	1	.757	.744	.982	.878	.884	1.006
	7	.970	.973	1.003	.983	.984	1.001
	14	.984	.984	1.000	.988	.989	1.001
	21	.990	.987	.997	.993	.993	1.000
	28	.985	.985	1.000	.985	.985	1.000
	35	.990	.980	.990	1.000	1.000	1.000
3	1	.632	.614	.971	.851	.845	.990
	7	.908	.915	1.007	.973	.969	.996
	14	.952	.956	1.002	.996	.984	.987
	21	.980	.966	.986	1.000	1.000	1.000
	28	.985	.985	1.000	.995	.995	1.000
	35	.995	.995	1.000	.995	.995	1.000
4	1	.530	.479	.903	.733	.745	1.015
	7	.874	.848	.966	.960	.962	1.001
	14	.954	.960	1.006	.974	.980	1.005
	21	.960	.966	1.006	.980	.983	1.002
	28	.990	.990	1.000	.985	.990	1.005
	35	.985	.982	.997	.990	.995	1.004
5	1	.473	.406	.860	.626	.639	1.019
	7	.836	.791	.946	.929	.929	.999
	14	.878	.908	1.033	.966	.956	.990
	21	.906	.932	1.028	.990	.991	1.001
	28	.970	.970	1.000	.985	.990	1.005
	35	.990	.990	1.000	.990	.985	.996

sistency is an index of the degree to which the discriminations are affected by chance errors, and that the ratio obtained by dividing group consistency by self consistency is an index of the amount to which the discriminations of individuals are affected by constant errors. If a constant error pervades a whole group to an approximately equal amount, the objectivity ratio would be approximately 1.00, but such a situation would be a reflection on the sampling rather than on the technique for determining objectivity.

If subjectivity is introduced by the appearance of constant errors

peculiar to the individual but not to the group, the amount of subjectivity should be reduced by pooling the results of a number of subjects, for the errors which are constant for the individual will be random for the group.

The results obtained from the 5 series of circles have been pooled by 7's, 14's, 21's, 28's, and 35's. Each pool is treated as an individual. Consequently it is possible to compute self consistency and group consistency, employing the same technique as in the earlier parts of the paper.

A glance at Table 3 will show that pooling has no effect upon the objective scales, unless it be to stabilize them. The objectivity ratios are all approximately 1.00. This is a confirmation of the view previously expressed that, when only random errors are present, the scale employed may be considered objective.

Similar pooling was done with 5 of the personality traits. Because the number of individuals was 10, a pool composed of the judgments of 5 individuals was the largest that could be obtained. In Table 4 there appears a comparison of the individual consistencies with the pooled consistencies.

TABLE 4

Trait	S.C.	By 1's	Ratio	S.C.	By 5's	Ratio
		G.C.			G.C.	
Industry	.707	.447	.632	.848	.784	.926
Procrastination	.555	.340	.612	.788	.739	.937
Stubbornness	.572	.283	.494	.704	.629	.894
Emotionality	.644	.336	.522	.767	.669	.873
Touchy	.565	.278	.492	.764	.658	.863
Mean	.609	.337	.552	.774	.696	.899

When ratings are pooled by 5's, the objectivity ratio approaches closely to unity. With increase in the number of records pooled, it should equal unity. When this happens, it means that individual constant errors become group random errors. With the objective scales, pooling produced an approximately equal increase in both self consistency and group consistency. With the subjective scales, pooling by 5's produced an increase of only 27% for self consistency, whereas it produced an increase of 107% for group consistency.

SUMMARY

1) A scale may be considered objective when group consistency and self consistency are approximately equal.

2) When group consistency and self consistency are equal, the errors involved in the discriminations are, in all probability, random or chance errors.

3) Pooling of results leaves the ratio obtained by dividing group consistency by self consistency equal to 1.00 when objective scales are used, though there is a progressive increase in the value of both terms with increase in the number of results pooled.

4) A scale may be considered to be subjective when self consistency is appreciably higher than group consistency.

5) This condition appears when individual constant errors are included together with the random errors.

6) The pooling of results obtained by the use of subjective scales makes the scale approach complete objectivity, at least when personality ratings are used.

7) The size of the group consistency correlation is an index of the degree to which the discriminations are saturated by constant errors.

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UNE COMPARAISON DES ÉCHELLES OBJECTIVE ET SUBJECTIVE DE MESURE

(Résumé)

L'assertion non prouvée que les tests d'intelligence sont objectifs tandis que les évaluations de personnalité sont subjectives a fait faire à l'auteur de cet article une série d'expériences pour déterminer les traits caractéristiques des échelles objective et subjective. Les échelles objectives employées ont été celles de poids, de longueur, de superficie, et de nombre. Chaque série s'est composé de 10 parties, et on a employé 47 séries. On a employé la méthode de différences de rang, chaque sujet rangeant deux fois les dix parties d'une série en ordre de mérite, chaque fois à une heure différente. La moyenne des corrélations entre les mêmes sujets donne la constance

individuelle. La moyenne des corrélations entre les rangs donnés par les divers sujets donne la constance collective. L'analyse des résultats montre que la constance individuelle et la constance collective sont presque égales; c'est-à-dire, $C.C./C.I. = 1,00$. Les résultats, pris ensemble, n'influent pas sur la valeur de cette proportion.

Les échelles subjectives employées ont été les évaluations de personnalité, les réponses données aux annonces, et les évaluations d'intérêt, faisant 20 séries. La technique a été la même que celle employée avec les échelles objectives. Les résultats montrent que la constance individuelle est toujours plus élevée que la constance collective, la proportion $C.C./C.I.$ étant moins que 1,00. Avec les résultats pris ensemble, nous avons l'unité.

Ces résultats nous donnent la conclusion, confirmée aussi par les expériences où l'on a donné des cartes, que l'échelle objective n'admet que des erreurs constantes, tandis que l'échelle subjective admet des erreurs inconstantes et constantes. La mémoire joue un rôle important dans les erreurs constantes, et le résultat est que la constance individuelle est plus grande que la constance collective.

ADAMS

EIN VERHÄLTNIS DER OBJEKTIVITÄT ZUR SUBJEKTIVITÄT FÜR MESSUNGSSKALEN

(Referat)

Die unerwiesene Behauptung dass Intelligenz Tests objektiv sind im Gegensatz zu subjektiven persönlichen Wertungen, bewog den Verfasser eine Reihe von Versuchen anzustellen um die charakteristischen Merkmale des Objektiven im Gegensatz zum Subjektiven zu bestimmen. Die objektiven Skalen die angewandt wurden waren, Gewicht, Länge, Flächeninhalt, und Anzahl. Jede Serie bestand aus 10 Items und man wandte im ganzen 47 Serien an. Nach der Unterscheidungsmethode ordnete jede Vp. zweimal die 10 Items einer Serie je nach der subjektiven Wertschätzung. Die Korrelationen zwischen denselben Vpn. ergaben durchschnittlich Selbstbeständigkeit der Wahl. Die Korrelationen zwischen den Reihenfolgen nach der Wahl der verschiedenen Vpn. ergaben im Durchschnitt Gruppenbeständigkeit. Eine Analyse der Resultate ergibt dass Selbstbeständigkeit und Gruppenbeständigkeit anähernd gleich sind; das heisst, $G.-B./S.-B. = 1.00$. Eine Zusammenstellung ergab keine Veränderung des Verhältnisses.

Die subjektiven Skalen die man anwandte waren, persönliche Wertungen, Anziehungskraft der Reklame und Bewertung des Interesses, im ganzen 20 Serien. Das Verfahren war identisch mit dem, das man bei den objektiven Skalen gebraucht hatte. Die Ergebnisse beweisen dass Selbstbeständigkeit stets höher steht als Gruppenbeständigkeit, indem das Verhältnis $G.-B./S.-B.$ geringer als 1.00 ist. Beim Zusammenstellen nähert sich das Verhältnis der Einheit.

Die Ergebnisse führen zu dem Schluss, auch durch Experimente mit Karten geben bestätigt, dass das Objektive eine Skala ist die nur konstante Irrthümer zulässt, wogegen das Subjektive, zufällige sowohl wie konstante Irrthümer zugibt. Das Gedächtnis spielt eine grosse Rolle bei den konstanten Irrthümern, und folglich wird die Selbstbeständigkeit grösser als die Gruppenbeständigkeit.

ADAMS

WHY DO WE WEEP?*

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Of the traits which distinguish man from the lower orders laughing and weeping are the most characteristic. In fact, man has been said to be the only animal that laughs. It would be nearer the truth, however, to say that he is the only animal that weeps; for, while anthropoid apes are known to laugh, there are no known species that shed tears as a result of emotional stimulation.¹ Notwithstanding this fact, weeping has held no place comparable with that of laughter in the interest of the philosopher and scientist. That weeping is a much less frequent reaction may have had something to do with its neglect. The tendency to avoid the unpleasant may also have been a factor. Likewise, there may have been a feeling that weeping represents too intimate a reaction to be subjected to critical analysis. But equally important has doubtless been the tendency to take the cause of tears for granted—that they are, of course, aroused by sorrow and depression. Such an attitude does not stimulate scientific inquiry.

In attempting a scientific approach the investigator is confronted with the difficulty of effecting the lacrimal discharge under laboratory conditions because of an inability to reproduce the social situations in which the reaction typically occurs. The “tender spot” and the stimuli which effect it are largely an individual matter, varying with the constitution and training of the subject and the amount of social sanction enjoyed by its manifestations.

DEFINITION AND CLASSIFICATION

A certain ambiguity is present in the usage of the terms describing lacrimation and its attendant emotions. “Crying” may refer to the typical reactions accompanied by tears, or to similar reactions unac-

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¹Darwin cites unconfirmed instances of elephants and certain species of monkeys shedding tears (4, pp. 165, 360).

accompanied by them, as in the case of infants before they have reached the age of tears or of apes when making their clamorous outcries. The term "weeping" is more satisfactory in this respect, since it is used to describe only those reactions attended by tears. Similar difficulties are encountered in the usage of the terms describing related emotions such as sadness, sorrow, grief, and dejection.

Again, a distinction should be made between the shedding of tears in emotional situations and their occurrence as reflex discharges under chemical and mechanical stimulation. Our interest is mainly in the former, since these alone constitute true cases of weeping. The following represent the main non-emotional stimuli for tears:

- 1) Irritation of the eyeball and lids through contact with foreign objects.
- 2) Irritation of the mucous membrane of the nose through inhalation of strong vapors or through some form of mechanical stimulation.
- 3) Violent laughter, coughing, retching, vomiting, sneezing, or yawning.
- 4) Stimulation of the retina with infra-red or ultra-violet rays.

To these might be added a group of semi-emotional conditions providing for tears. Of such conditions increased tension under pain is perhaps the most familiar. The effectiveness of a stinging switch on the face or of a blow on the nose is also well known.

PHYSIOLOGICAL CONSIDERATIONS

Physiologically the immediate cause of tears is the secretion of the lacrimal glands, which occupy the upper and outer portion of the ocular orbital cavity. Like most other organs influenced by emotional states, these glands receive innervation from both the cranial and the sympathetic divisions of the autonomic nervous system. The cranial supply comes from the facial nerve, the sympathetic from the nerves of the superior cervical ganglion. Both pass through the sphenopalatine ganglion, with the cranial alone, however, synapsing in this ganglion. Sensory impulses from the tear glands pass over the lacrimal nerve, a branch of the trigeminal.

The twofold source of innervation in this, as in other cases of organs influenced by emotions, gives rise to the question as to which supply is exciting and which is inhibitory. Is the cranial supply of the lacrimal glands responsible for the flow of tears and the sympa-

thetic inhibitory, or is the reverse the case? The answer to this question is of first importance in any attempt to give an account of the emotional stimuli which will produce the discharge, since it is generally known that the cranial autonomic nerves function in euphoric states and the pleasant emotions, the sympathetic in the unpleasant emotions. This means that if action over the sympathetic nerves is facilitating, then disagreeable emotional stimulation should occasion the release of tears. On the other hand, if the seventh cranial nerve furnishes such supply, then more agreeable stimulation must occasion their release. So far no answer to this question seems to have been attempted. Yet it is certainly of importance not only theoretically but practically; for if, as the writer expects to show from the results presented in this paper, the release of tears is effected through alleviating and agreeable forms of stimulation, rather than the reverse, then it should have therapeutic value to be able to produce them under given conditions of stress and strain, since it should tend to initiate all those preservative and upbuilding functions associated with cranial action.

The apparent inconsistency of crying from joy as from sorrow, from aesthetic as from unpleasant stimulation, also calls for some explanation. Some common element must be found in these diverse situations since the same neural discharge cannot be initiated by opposed forms of stimulation. The facts which we have to present will show that, although both sympathetic and cranial action are doubtless involved, the immediate occasion for the release of tears is a cranial discharge. Consistent with this is the contention that the common element in all occasions for lacrimation is a pleasant or at least an alleviating stimulus.

LACRIMATION UNDER PATHOLOGICAL CONDITIONS

Through the cooperation of Superintendent J. A. Jackson and Clinical Director H. V. Pike of the Danville State Hospital of Pennsylvania, we were enabled to make some observational studies which yielded quite interesting results.

A preliminary survey of the various wards was made for the purpose of securing patients with lacrimose dispositions. Of available patients showing such a disposition, only 17 women and 2 men were reported by those in charge. And of these only 4 had a suf-

ficiently low threshold to allow for lacrimation under appropriate verbal stimulation.

Our interests were first turned to the manic-depressive group. If the popular conception that weeping results from sorrow and depression is correct, then a patient showing extreme, unadulterated depression should be very lacrimose. Yet no patient was found who wept while in the midst of a depressive psychosis. Of the manic-depressives under observation, the only instances of tears occurred during what appeared as a transition from a depressed to an exalted state. Dr. Pike confirmed these findings from work with larger groups. It was observed that the patients described as "depressed" might present very different clinical pictures, all the way from an inactive sodden depression to a very active or agitated depression. Under these conditions the term "depression" would be descriptive only of the disagreeable quality of the emotional state. One case of agitated depression diagnosed as "manic-depressed-depressed" was of special interest because of being reported as "constantly crying." That excess sympathetic action alone is not conducive to tears is evidenced from her case, since all the symptoms were of hyperaction in this sphere. The following is a brief account of her behavior on one occasion:

J. A. As she entered the room she appeared to be in extreme distress, gasping for breath and complaining "My side, my heart, and my head are hurting me terribly" (places her hand successively on the ailing parts). When asked why she should be suffering so when nothing apparently could be done to relieve her, she answers, "To tell the truth, doctor, I think it is my soul, I used to have faith—but now I think I have done something wrong. I don't have faith—but I have prayed and I don't get relief. Oh, can't you do something for me?" (wrings her hands as in despair). Her short breathing, her drawn facial expression, her moaning and complaining, might best be described as "crying." Yet there were no tears, and upon investigation it was found, although reported as "constantly crying," no one had seen her actually shed tears. During the interview all attempts to bring her to tears failed. Consolation, sympathy, harsh treatment, were all equally ineffective. In a way this was to be expected on the assumption that cranial action is necessary to the lacrimal discharge, since all her symptoms were of excess sympathetic action; and, accordingly, stimuli directed toward cranial action were of no avail. The sympathetic discharges, which doubtless were responsible for her fears, hypochondrias, and arterial hypertension, functioned inhibitorily to cranial action.

Contrast the behavior of this patient with the following case, also diagnosed as "manic-depressed-depressed."

H. R. The patient entered the room with drooping posture, showing all the symptoms of general psychomotor retardation. When questioned, her re-

plies, while relevant, come very slowly and feebly. Her difficulty, according to the physician's report, came on following childbirth. She attributes her condition to her father's death which occurred during her period of pregnancy. She has hallucinations of hearing him speak to her and of seeing him as he appeared in his coffin. Her exhaustion psychosis, accompanied by the above symptoms, first showed itself during pregnancy and became acute following childbirth. While extremely depressed, it did not seem possible to bring her to tears. As determined by outward manifestations, the nearest she came to tears was when she was relating a trip to her father's grave. A twitching of her lips occurred as she mentioned her husband's tears on this occasion.

The extreme psychomotor retardation of this patient presents the truest picture of depression. Her emotional and physical condition is inhibitory to glandular as well as to muscular activity. Tears are certainly not associated with this inactive sodden depression. Their appearance may be considered indicative of renewed hope and of emotional contact with the social environment.

The pathological condition most favorable to tears is not one of depression nor of exaltation or excitement, but of mild euphoria and a somewhat mixed emotional state, such as occur not infrequently in paresis, multiple sclerosis, and arteriosclerosis. Our most facile subjects belonged to these groups. One or two of these we shall describe briefly:

K. R., a female patient, seemed pleased to be brought into consultation, smiled and immediately became communicative. She appeared in good health and was rapidly gaining weight. The first questions regarding time of commitment and length of stay in the hospital were answered correctly and without show of emotion. When being questioned, however, as to the circumstances of her commitment she cried profusely as she exclaimed, "I was sick but had to work like a horse" (self-pity). Redirecting her attention by talking about the wards and the nurses it seemed not very difficult to calm her. In fact, it was easy enough to make her laugh. She said she felt fine, but wanted us to write to her husband so he'd come and get her. When speaking about how good he had been to her and what "a big-hearted man" he was, she again wept (tender emotion). With a turn in the conversation bringing up a point on religion she spoke up with some defiance and satisfaction, declaring that whereas her husband was Catholic she was Protestant, and had brought up her children Protestant just as she had told him she would. Seeming again to feel more friendly disposed toward him, she wept once more as she said, "But he was always good to me, and I want to see him."

The interesting thing about this case was the ease with which the patient could be made to weep or to stop weeping, or, again, to laugh. On our second visit she again cried as she said she was sure her babies were missing her.

M. P., a senile patient with arteriosclerosis, while less coherent than *K. R.*, presented in all other respects a similar condition with ease of lacrimation

particularly when the matter of "going home" was brought up for consideration.

B. S., diagnosed "psychopathic personality," displayed an emotional state not unlike that of K. R., but on the whole much more agreeable to deal with. There was evidence of a Parkinsonian disorder, possibly with a thalamic lesion, as evidenced from a unilateral tremor. Emotional instability associated with the syndrome is a well-known phenomenon. The patient seemed in good spirits and gave relevant replies to all questions. The nurse reported that she cried easily when her mother came to see her or when she did not hear from home. At the close of the interview, when the examiner asked her if she would like to go home, she began to weep as she said, "I've sure been here long enough" (sympathy and self-pity).

Jelliffe and White (8), in describing the changeability in mood and emotionality of the expansive paretic, refers to the frequency with which weeping may occur in the midst of ecstasy and sublime happiness (p. 796). The same authors refer to "involuntary laughing and crying" with euphoria and facile interchange of exaltation and depression in the case of multiple sclerosis (pp. 571, 1036). The disorder in this case is attributed to cortico-bulbo-cerebellar reflex pathways. "Lack of emotional control with alternate weeping and laughing" is also referred to by Rosanoff (9, p. 629). White calls attention to the same phenomenon in multiple sclerosis (11, p. 303). A somewhat similar condition, according to Buckley (3), obtains occasionally in hebephrenia: "Protracted crying spells for which the patient can give no reason are not uncommon; likewise causeless laughter is induced by the stimuli which in the normal would be inadequate" (p. 311).

It is a matter of note that in all the above conditions the lacrimose disposition is associated with euphoria. The same may be said of the affective states in pseudo-bulbar palsy regarding which Cannon reports "uncontrollable and prolonged fits of crying and laughing" (4, p. 117). Tilney and Morrison (10), who made a special study of 173 cases of pseudo-bulbar palsy, report alternate crying and laughing in 17% of the cases, crying alone in 16%, and laughing alone in 15% (p. 505).

Increased thyroid secretion producing restlessness and excitability may also effect a low threshold for tears, according to Rosanoff (9, p. 435), Crile (5, p. 106), and Cannon (5, p. 113). This is particularly noticeable in the adolescent girl. Increased thyroid action during this period not only produces increased sexual irritability but lowers the threshold for all emotional stimuli. On the other hand, atrophy of the thyroid gland, as in cretinism, is characterized by an

entire absence of tears. In Graves' disease there is hyper-secretion of both the adrenal and the thyroid (5, p. 106). Adrenal action may account for the patient's susceptibility to anger, increased thyroid secretion for the unusual display of tender emotions and tears, since thyroid action tends to increase action over the cranial and sacral nerves. The influence of hyperthyroidism upon the cranial nerves and the lacrimal glands tends to substantiate the position that lacrimal secretion is directly under cranial autonomic control.

M. V., a hyperthyroid patient under observation at the Danville hospital, showed all the usual symptoms of nervousness and excitability associated with this disease. She was very easily moved to tears, particularly when mention was made of her home and babies.

But the most conclusive evidence from pathological sources that the cranial and not the sympathetic nerve supply is responsible for the lacrimal discharge and that tears, therefore, are aroused by some pleasant or at least some mitigating form of stimulation is to be found in the effects of injury to these two sources of nerve supply. Jelliffe and White (8) report that paralysis of the cervical sympathetic nerves causes an increase in tears (p. 168). This would indicate that their action has an inhibitory rather than a facilitating effect. On the other hand, they find that paralysis of the facial nerve (the cranial supply to the tear glands) causes a suppression of tears, which would make their normal action facilitating. If the paralysis of this nerve is merely peripheral, then the increased action of the deeper-lying fibers causes increased lacrimal discharge (pp. 376-380). That such increase is likely to be associated with euphoric conditions is again seen from the fact that vagotonic reactions, which themselves tend to produce general euphoria because of their nutritive and upbuilding effects, also lower the threshold for tears (p. 163).

LACRIMATION OF INFANTS

The greater frequency of weeping in infancy and its gradual restriction during childhood is attributable largely to training and to disparagement of the reaction as infantile. This attitude of disparagement would seem to develop from an implicit recognition that weeping represents an appeal for sympathy, or a demand for assistance not worthy of the adult.

During the first few months the crying of infants does not imply the emotional upheaval associated with this reaction in adults. It is almost purely reflex in character and serves as an outlet for nervous

energy accumulating in the centers when the infant is under given forms of stimulation. The deeper autonomic involvement of the reaction in later infancy becomes apparent in the secretion of tears, which do not occur at first, and likewise in sobbing induced by the involuntary and spasmodic contractions of the respiratory muscles. Other involuntary and autonomically controlled muscles involved under these conditions are the depressor muscles, which draw down the corners of the mouth causing it to assume a squarish outline and giving the face the pitiful expression associated with tears. That these muscles, like those involved in sobbing, are less under voluntary control is seen from the fact that they are the first to show the signs of an approaching crying spell which the child is trying to suppress.

The age at which tears first appear seems to be a disputed question, being variously designated all the way from 10 to 130 days. The fact that the maturation process is itself a variable and that observers may differ in their interpretation of the reaction may account for this difference in opinion. The writer's opinion, based upon observations now in progress, is that the age usually given is too young and that unmistakable secretions properly designated as tears do not appear in most infants until the second or perhaps the third month.

Weeping in the infant, as in the adult, is largely a social reaction appearing typically under some form of social stimulation. That its first appearance in the infant is simultaneous with the beginning of social recognition may be a significant correlate. The social implications of weeping are apparent in the results of an experiment performed by the writer on a 12-month-old baby. It was placed in a crib where it was able to stand alone with the aid of a bar placed horizontally and at such a height as to be convenient to grasp. In the experiment the bar was occasionally so adjusted that a slight jerk would release it with the result that the baby would drop. The effects of this unexpected development were found to vary with the presence or absence of the mother. If the mother was present, it would be very apt to cry, particularly if she would come over and express her sympathy. The ease with which conditioning took place made the experiment valueless after a few repetitions.

The angry cry of the child is rarely accompanied by tears unless such crying is prolonged. Darwin (6) tells of the case of a 9-month-old child which frequently indulged in such spells without any evidence of tears, but with whom tears became profuse when

"punished by having its chair turned with its back to the table" (p. 153), this situation being effective in arousing feelings of self-pity.

LACRIMATION OF ADULTS

The relative infrequency of lacrimation in adults and the very special situations in which it occurs practically prohibits experimental approach. Accordingly, what we have to report is limited largely to observational studies at funerals, weddings, theatrical and musical performances, and other situations in which such display of emotion normally occurs. In this connection the writer had the cooperation of a class in psychology, the members of which were requested to report in detail cases of crying observed during the semester.

Laughter and Weeping. Alternate or even simultaneous laughing and weeping is not at all unusual. When occurring simultaneously, however, the tear secretion is frequently not a true instance of weeping. This is the case when muscular strains and intra-orbital pressure during violent laughter effect a lacrimal discharge. On the other hand, the same emotional condition occasionally seems to find an equally good outlet in weeping or in laughter. Particularly is this true in certain pathological states, being observed in the exalted states of mania and paresis, in multiple sclerosis, pseudo-bulbar palsy, and hebephrenia. The psychiatrist Bianchi (2), possibly in an attempt to give consistency to what seemed to him inconsistent, speaks of weeping occurring with laughter as a kind of mimicry (p. 360).

In a number of observed instances crying was very easily turned into laughter in the case of children if a sudden or amusing stimulus was presented just as they were beginning to cry. Where such reversals occur it would seem that either reaction serves equally well to expend the accumulating nervous energy. The following case, reported by a student, is a good illustration of a mixed emotional state leading with equal ease into the two forms of emotional expression:

A girl went into a very low closet in a garret to secure some needed article. She had barely entered before the door, which could be opened only from the outside, blew shut. For two hours she was obliged to remain crouched in the cold and uncomfortable enclosure. Chagrin, self-pity, amusement, and vexation, produced a condition of alternate laughing and weeping when released.

Relief from Tension. Relief from tension is one of the most fre-

quent occasions for lacrimal discharge. A few typical instances may be noted:

A mother who very rarely wept was thrown into a state of anxiety when her daughter's pony returned home minus its rider. When the missing girl was brought home safe and sound several hours later, she broke into an uncontrollable fit of weeping.

A man who had worried for some time for fear that he was going insane called at the Danville hospital for an examination. When this had been made, and the psychiatrist had assured him that he was not "losing his mind," he hurried from the room with tears streaming down his face.

In a recent boxing match, a contender for the heavyweight championship shed tears as he returned to his corner after delivering his opponent a knock-out blow.

Other illustrations might be added to these of individuals moved to tears with the realization of some high honor or a much desired objective. In these, as in the above, the secretion is effected when a pleasure stimulus or an alleviating stimulus introducing cranial action follows a period of tension with hyper-action of the sympathetic. Weeping, under these conditions, and the convulsive reactions of the respiratory system accompanying it, has a cathartic value in that it furnishes an outlet for the energy which has accumulated during the period of tension. Such release is very much better than to allow the energy to smoulder in the system. It is for this reason, no doubt, that we "feel better after our cry." The clarifying and beneficent effects of weeping are likened by Backmann (1) to the effects of a rain after a thunder storm: "Ein stummer Schmerz wirkt beängstigend wie ein Gewitter ohne Regen. Was für die Entspannung der elektrischen Dämpfe des Gewitters der Regen bedeutet,—das bedeuten der Tränen für den Organismus des Menschen" (p. 9).

Weeping under Loss. Sudden privation or the loss of a prized object are perhaps the most familiar situations effecting lacrimal secretions. The emotional upheaval aroused by bereavement is due to intense stimulation without adequate outlet for the liberated energy. In this connection two things are noteworthy: First, the individual so affected may not weep at all if the situation is one calling for immediate action. Secondly, relief in tears is most apt to occur when the situation gains a redeeming feature. The following cases are illustrative of these conditions:

A physician had the mangled body of his son brought in from the street where he had been run over. He hurried the boy to a hospital where an operation was performed. Death occurred a few hours later. The physician wept for the first time when the boy's mother related a beautiful incident from the boy's behavior that morning.

A wife whose husband had died three days previously seemed to have been stunned by the blow, showing no emotion outwardly except extreme depression. She broke down in tears as a friend brought in a beautiful wreath.

Observations made by the writer at funerals again show the value of a pleasure stimulus and the extent to which weeping in such situations represents a mingled emotional state. Reference by the minister to some admirable trait in the character of the deceased or to some heroic incident in his life produced marked emotional effects and increased lacrimation. Music and singing of a familiar hymn written in a minor key, such as "Rock of Ages," were still more effective. Even in connection with privation and loss, then, a pleasure element or a redeeming feature introduced in the midst of the generally depressing circumstances serves to release the flow of tears. Tennyson seems to have been aware of this when he wrote the following lines in "The Princess":

"Home they brought the warrior dead;
She nor swooned nor uttered cry.
All her maidens, watching said,
'She must weep or she will die.'

To this end several unavailing devices are introduced until

"Rose a nurse of ninety years,
Set *his* child upon her knee—
Like summer tempest came her tears—
'Sweet my child, I live for thee.'"

Weeping for Joy. When individuals "cry for joy" it is usually a case of relief from tension or of mingled feelings not unlike the situations recorded above. We shall give one or two instances:

In an army hospital for wounded soldiers in France a woman passed through looking for her nephew, whom she found and embraced. This happy or perhaps unhappy meeting drew the tears not only of the two immediately concerned but of almost every soldier in the ward.

Crile calls attention to "an extraordinary tendency to laugh and to cry when in love," and cites the case of a young woman who wept when she received a proposal for marriage from the man she loved.

Cases of weeping upon reunion after long separation are familiar to all.

According to Dearborn (7), lacrimal secretion under the emotion of joy is only an aspect of general activity in which "the whole glandular system is stimulated, causing the secretions—gastric, salivary, lacrimal, sudoral, mammary, genital, etc." (p. 63).

Sympathy and Self-Pity. The case of an individual who is feeling abused or depressed who starts to weep when someone offers sympathy must be familiar even to the casual observer. On the other

hand, harsh treatment or even an attitude of indifference and depreciation will, under the same conditions, tend to inhibit any disposition toward tears. Darwin (6) maintains that the best way to check the "occasional weeping of ladies who wish to desist is to beg them earnestly not to try to stop, and to assure them that nothing will relieve them more than prolonged and copious crying." In other words, it is not conducive to such indulgence to be required to look upon the act as a therapeutic measure rather than an expression calling for sympathy and pity. Pitying a child for some small hurt very easily brings it to tears. A boy playing in the street fell and bruised his knee. The injury being slight, he soon returned to his play. On seeing his mother, however, he ran to her, showed her the sore place, and began to weep. A patient in the Danville hospital, who showed to a marked degree the self-pitying attitude with delusions of persecution, wept profusely when she found an open mind for her tales of woe. The disposition to make a martyr of one's self, and to weep when this attitude meets with approval and consolation from the outside is not at all uncommon among normal adults. The "pleasure element," which under such conditions effects the lacrimal discharge, arises from the satisfaction which seems to inhere in viewing one's self as an object of sympathy and as the "suffering hero."

The Dramatic. A well-known psychologist cited the following incident as typical of situations in which he had experienced the strongest disposition to weep.

Coming down a street in New York, he was much incensed at seeing a boy being bullied and knocked around by a larger boy. Suddenly the smaller boy took courage and fought, succeeding after several well-directed blows in driving off his assailant. It was with this unexpected but much desired change of affairs that the psychologist experienced his emotions.

In this situation we have all the elements of the dramatic: It contains the hero, who is placed under adverse circumstances, and with whose fate the interests and desires of the audience become identified. A climax is reached in which the hero comes to his own, overcoming all the obstacles which up to this point have stood in the way of success. Through the thwarting circumstances leading up to the climax, the desires and motivations of the audience have been sharpened and are, accordingly, realized with so much greater satisfaction with the resolution of the play. That it should be at the climax with the introduction of the satisfying or pleasure element that a disposition to weep should be aroused is entirely in accord with our analysis of the occasion for tears.

Confirmation of this view was secured through a study of certain reading selections and some observational studies at a group of New York theaters presenting plays which were of high dramatic quality and unusually effective in drawing the tears of the audience.

In the reading selections subjects were asked to indicate the lines most effective in arousing lacrimal tendencies. The selection yielding most agreement was one describing Lindberg's transatlantic flight. The lines most frequently referred to were those describing the successful arrival in France with "Paris rising in her emotional might to acclaim the hero," and, again, those featuring the departure of "a lone silver silhouetted figure winging its way over those vast waters and disappearing in the gray dawn shrouding the Atlantic." The actual events themselves were, as we all recall, of the most dramatic. They contained all the elements of narrative technique necessary to arouse the emotions: the theatrical stage setting, colored and intensified through the failure of others; the restraint, so necessary to a good story, introduced through the adverse weather conditions which for days prevented a take off; and the suspense following the departure kept at a maximum pitch through news bulletins appearing for several days.

The Aesthetic. It is doubtful whether any of us can experience any great depth of feeling or emotion except as we are presented with the ideal, or highly desired, and yet, the unattainable. And so in the presence of a beautiful scene or in listening to beautiful music, there sometimes comes a twinge of pain, an experience which inspired the well known lines:

"Tears, idle tears, I know not what they mean,
Tears from the depth of some divine despair
Rise to the heart and gather to the eyes
In gazing on the happy autumn fields,
In thinking of the days that are no more."

(From Tennyson—*The Princess*)

It is particularly when we have been softened by the tender emotions as at weddings, commencements, reunions, funerals, etc., that tears spring involuntarily to our eyes. The mingled state of feeling is here again the cause. The same may be said of the stirring qualities of music. That the minor scale should be more effective than the major in producing tears is because in the former we have the desired combined with the undesired, aesthetic strains combined with tonal elements falling short of consonance, and thus arousing the unrest and mingled feelings with a desire for the completeness of the major chord.

SUMMARY

Tears, when affectively produced, are indicative of a mixed emotional state. Neither sorrow, dejection, joy, nor elation, when oc-

curring in pure form, is very effective, if at all, in producing the lacrimal discharge. This discharge appears typically when a depressing or otherwise unpleasant situation gains a redeeming feature, or when tension and unpleasant stimulation are followed by pleasant or alleviating stimulation. This accords with the finding that the cranial nerve supply (usually active in pleasant and euphoric states) is facilitating, while the sympathetic supply (particularly active in unpleasant situations) is inhibitory. Both systems, however, are doubtless involved since action over the facial nerve (seventh cranial) is more effective when it follows a period of sympathetic activity. On such a basis we may find psychological and physiological consistency in the apparent inconsistency of "crying from sorrow" and "crying from joy." In support of these conclusions we present the following facts:

1) No case of weeping in the midst of a depressive psychosis was observed.

2) Not infrequently a patient became lacrimose when passing from a depressed to an exalted phase.

3) The pathological conditions most favorable for tears appear to be those of mild euphoria and mixed emotional states such as may occur in paresis, multiple sclerosis, general arteriosclerosis, and pseudo-bulbar palsy.

4) Paralysis of the cervical sympathetic nerves produces *increased* lacrimation, indicating that their normal action is inhibitory.

5) Paralysis of the facial nerve causes a *suppression* of tears, indicating that its normal action is facilitating.

6) Vagotonia and hyperthyroidism lower the lacrimal threshold, while inhibition of vagus action or atrophy of the thyroid will raise the threshold.

7) In infants and adults, sympathy, when offered under depression as a mitigating or consoling stimulus, is highly conducive to tears and has as its natural correlate the equal effectiveness of self-pity.

8) Weeping, when accompanying laughter or following tension, occurs as a natural outlet for energy liberated under emotional stimulation and usually appears with the introduction of an alleviating circumstance.

9) Weeping under loss seems to occur when there is no other outlet for emotional tension and is typically induced when an extenuating event or comforting association becomes a part of the situation.

10) Weeping under joy and under dramatic or aesthetic stimulation is an expression of conflicting emotional states with the pleasure element dominant.

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POURQUOI PLEURONS-NOUS?

(Résumé)

Les larmes, produites d'une manière sensible, indiquent un état émotif mixte. Ni la douleur, ni l'abattement, ni la joie, ni l'exaltation seules ne sont très capables ou ne sont point capables de produire la décharge lacrymale. Cette décharge a lieu d'une manière typique quand une situation affligeant ou autrement désagréable possède quelque chose d'allégeant, ou quand la tension et la stimulation désagréable sont suivies d'une stimulation agréable ou allégeant. Cela s'accorde avec la constatation que l'action des nerfs crâniens (actifs généralement dans les états agréables et l'euphorie) allège, tandis que l'action des nerfs sympathiques (actifs surtout dans les situations désagréables) est inhibitoire. Les deux systèmes d'ailleurs se mettront en action puisque l'action du nerf facial (septième crânien) est plus effective quand elle suit une période d'activité sympathique. Sur telle base la contradiction apparente entre "les larmes au sujet de la douleur" et "les larmes au sujet de la joie" n'existe pas au point de vue de la psychologie et de la physiologie. Les conditions pathologiques les plus

favorables aux larmes ne sont celles ni de grand abattement ni d'exaltation, mais plutôt celles d'une faible euphorie et des états émotifs mixtes qui peuvent exister dans la parésie, la sclérose en plaques, l'artério-sclérose générale, et la paralysie pseudo-bulbaire. Normalement, la sympathie et la pitié de soi-même, dans leur rôle allégeant et consolant, peuvent être considérées les stimuli les plus effectifs des larmes. Les larmes au sujet d'une perte sont presque aussi fréquentes, mais dans ce cas aussi la réaction est produite d'une manière typique quand la situation possède quelque chose d'allégeant.

LUND

WARUM WEINT MAN?

(Referat)

Thränen, durch Affekt bewirkt, bedeuten gemischte Gefühle. Weder Kummer, noch Schwermut, noch Freude, noch Exaltation sind allein und ungemischt sehr wirksam—wenn überhaupt—im Hervorbringen der Thränen. Dieses Weinen erscheint typisch wenn zu Verstimmung oder in schwieriger Lage ein mildernder Umstand hinzukommt, oder auf Spannung und unangenehme Reizung, angenehme oder doch lindernde Reizung folgt. Dies stimmt mit dem Befund überein dass die Gehirnnerven (die gewöhnlich bei behaglichem oder euphoristischem Zustand tätig sind) eine günstige Wirkung ausüben wogegen der sympathetische Nervenkomplex (besonders tätig in unbehaglichem Zustand) hemmend wirkt. Ohne Zweifel sind jedoch beide Systeme beteiligt, da Tätigkeit über dem Gesichtsnerven (der siebente Gehirnnerv) wirksamer ist wenn sie auf sympathetische Tätigkeit folgt. Auf solcher Grundlage möchten wir wohl psychologische und physiologische Konsequenz in der scheinbaren Inkonzsequenz des "Weinens vor Kummer" und des "Weinens vor Freude" finden. Die pathologischen, den Thränen günstigsten Zustände sind nicht die äusserster Schwermut noch die höchste Exaltation, sondern vielmehr diejenigen milder Euphorie und gemischter Gefühle wie sie bei Paresis, vielfacher Sklerose, allgemeiner Arteriosklerose, und Pseudo-bulbärparalyse vorkommen. Unter normalen Bedingungen sind Mitgefühl und Selbstbedauern in ihrer lindernden und tröstenden Wirkung wohl die wirksamsten Anreizungen zum Weinen. Weinen wegen Verlust ist kaum weniger häufig doch auch in diesem Fall wird die Reaktion typisch herbeigeführt wenn ein mildernder Umstand hinzukommt.

LUND

SHORT ARTICLES AND NOTES

PERMANENCE OF INTERESTS OF ADULT MEN

EDWARD K. STRONG, JR., AND HOPE MACKENZIE

Measurement of particular abilities and specialized interests is essential to the development of educational and vocational guidance. Recent work by Cowdery, Craig, Freyd, Hogg, Hubbard, Miner, Moore, and Strong has focused attention upon the measurement of interests. If interests are constantly changing, either back and forth or in some progressive manner, their determination may be of use in diagnosing an individual's present condition, but they will be of little significance in guidance for the future. It is extremely important, then, that the permanence of interests be ascertained. This report presents additional data on this subject.

There have been only a few studies printed bearing on this topic, and conclusions are not entirely in harmony, possibly because of variations in method and in individuals studied. In general, it was found that among young children there is noticeable change in expressed interests, but that as high school and college students were studied, there was a successively greater and greater permanence of interest. Most of the studies examined dealt primarily with interest in school subjects. It is not surprising that children should change their preferences as they enter upon new fields of study and under new teachers. It would be of greater value to know whether grammar school children, for example, would show fluctuation in, or permanence of, interest with regard to objects or activities with which they had been familiar for several years.

Another problem of major importance is that of the cause of these interests. Are they due primarily to environment or to native capacities? If the former, then interests can reflect only past experience; if the latter, interests may indicate in a rough way the inherent make-up of the individual. The writers' hypothesis is that interests are based upon one's abilities but that they are evaluated largely in terms of social approval and disapproval. There is no particular interest in doing something very well if no one appreciates it; there is evident loss of interest in a performance if it is ignored or ridiculed by others. If this view is correct, evaluation of interests may prove to be of assistance in directing young people into the life work for which they are best fitted, so long as social conditions remain fairly permanent. But such guidance might be quite misleading whenever there is decided, sudden change in social evaluations.

The present study reports the permanence of interests of adult men over a period of a year and a half. Records were obtained from 100 ministers

and 100 certified public accountants upon the Cowdery Interest Blank in April and May, 1925. In December, 1926, these men were asked to fill out the Strong Interest Blank. Complete records were obtained from 61 ministers and 32 certified public accountants. Many of the C. P. A. group failed to give names and addresses with their first report, and this, of course, prevented any subsequent check on their interests. This is the main reason for the few cases in the C. P. A. group. Several blanks received could not be used as they were checked incorrectly or held too many omissions. Many of the subjects were over 60 years old and a distinct senile deterioration in ability to score the test was noted for the interval between the two reports.

The list of C. P. A.'s came from the office of the Secretary of the State Board of Accountancy, the original 100 C. P. A.'s representing about half of those registered in California. The ministers were mainly selected from those living in central California, largely from the Presbyterian Church. All had had at least 5 years of professional experience. These two groups were chosen for this study because the blanks for each were available and because as groups they are fairly discrete, their interests showing almost no overlapping.

Cowdery's blank contains 263 items to each of which the subject is asked to indicate his attitude, i.e., whether he "likes," is "indifferent to," or "dislikes" the item. The items name 84 occupations, 78 types of people, 79 miscellaneous activities, and 25 school subjects. Strong's blank contains 420 items. There are, however, only 176 items common to the two blanks, and it is in terms of these 176 items that this study of permanence of interest is made.

RESULTS

The 61 ministers' blanks were scored for minister and C. P. A. interests, and the 32 C. P. A. blanks were scored for C. P. A. and minister interests.¹ This cross scoring gives a double measure of permanence.

The correlations in Table 1 give a measure of the permanence of interest.

TABLE 1

CORRELATIONS BETWEEN SCORES OF MINISTERS AND C. P. A.'s ON MINISTERS' AND C. P. A.'s INTERESTS OVER A PERIOD OF 1½ YEARS

Ministers' Interests		C. P. A.'s Interests
61 ministers	.75 ± .04	.77 ± .04
32 C. P. A.'s	.81 ± .04	.74 ± .06

When the scores from Cowdery's blank are converted into measures in terms of the quartile of distribution we have ranges as follows:

¹For explanation of method of scoring see (1).

	On ministers' scale	On C. P. A.'s scale
Ministers	+2.8 to -3.1 Q	-3.5 to -9.9 Q
C. P. A.'s	-1.7 to -8.5 Q	+3.0 to -5.3 Q ²

There is no² overlapping in the distribution of ministers and C. P. A.'s when measured for C. P. A. interest, and only 10% of C. P. A.'s score -3.1 Q or above on the ministers' scale.

The above 4 correlations measure the permanence of interest over only one-half of an interest scale. There is a correlation of .74 on the C. P. A. scale from 3.0 to -5.3 Q, and a correlation of .77 from -3.5 to -9.9 Q.

If the ministers and public accountants are combined into one group, the correlation obtained when the ministers' scale is used is .90 (P. E. .02); and when the C. P. A. scale is used, it is .84 (P. E. .03). These correlations are too high, based as they are upon data in bimodal distribution. If data were at hand which fell between these two distributions to give a normal distribution, the permanence of interest would undoubtedly be represented by a correlation coefficient between .74 and .90.

Another method of determining permanence of interest is to ascertain the number of times each of the 176 items are checked alike and differently. This procedure gives to each item equal weight in measuring permanence of interest, whereas by the preceding method items were weighted in proportion to their diagnostic value in measuring either minister or C. P. A. interest. A preliminary sampling of the data indicated that there was nothing to gain by considering all of the 176 items. As a consequence only 10 items were chosen from each of the 5 main groups of items on the blanks. These 5 groups refer to occupations, amusements, school subjects, activities, and personalities.

There are 9 possible combinations of checking an item twice. It can be checked both times as liked (L), indifferent (I), or disliked (D), constituting "no change"; or it can be checked first as L and second as I, or I and D, or I and L, or D and I, constituting "one shift"; or it can be checked as L and D, or D and L, constituting "two shifts."

Data from the 61 ministers are presented in Table 2. The first line of this table is to be read as follows: Thirty-two per cent of the ministers indicated each time that they would like to be architects, 27% indicated indifference each time, and 5% expressed a dislike for the item both times; 5% changed from like to indifference, 7% from indifference to dislike, 12% from indifference to like, and 7% from dislike to indifference, a matter of "one shift"; and 5% reversed their attitude from like to dislike and 2% from dislike to like.

²Only 1 C.P.A. below -3Q. This 1 C.P.A. from among 100 wrote upon his blank that he disliked his work.

The ministers checked these 50 items the same way on both blanks in 71% of the cases. They shifted from liking or disliking to indifference, or the reverse, in 26% of the cases, and they really reversed their attitudes in 3% of the cases. This represents a high degree of permanence.

It is worth while to contrast these figures with those obtained purely on the basis of chance. Accordingly all the data from the Cowdery Blank were distributed so as to allot one-third to L, I, and D, respectively, on the Strong Blank. From the summary of these data it appears that whereas the ministers registered no change in attitude in 71% of the cases, chance would give but 32% of "no changes." Whereas they registered a change from like or dislike to indifference, or the reverse, in 26% of cases chance would give 44% of such shifts in attitude. And whereas they registered a complete change in attitude in 3% of cases, chance would give 21% of such shifts, 7 times as many.

It appears that ministers made proportionately more changes in the case of the personality items and proportionately fewer changes in the case of the amusement or school subject items. Ministers and authors, particularly women authors, find great difficulty in checking many of the personality items. Apparently they are unable to differentiate between liking and pitying unfortunates. Also, judging from their comments on the blank and their letters of protest at including such items in a test, they find themselves confronted by the dilemma that they may actually dislike a blind man but that they think they ought to like him. If they say they dislike him they are not true to their ideals; if they say they like him they are not telling the truth. Executives, engineers, and certified public accountants do not seem to be troubled by any such conflict. They register dislike to most examples of unfortunate people without the slightest hesitation.

Data from public accountants corresponding to those from ministers given in Table 2 are not given because there is no significant variation from that presented relative to ministers. The summary for accountants is as follows:

	No change	One shift	Two shifts
Actual response	71	23	5
Chance response	33	44	22

There is a slight tendency for C. P. A's to make more changes regarding personality items and fewer changes regarding amusement items, as noted for ministers, but the differences are too slight to be significant.

Both ministers and C. P. A.'s checked more dislikes against occupational items than against any other type. Both these groups are apparently satisfied and contented with their own work. This is equally true of artists, lawyers, physicians, and men school teachers. The average for all 6 groups is 96% liking their own work, 3% indifferent, and 1% disliking it. In

TABLE 2
RESPONSES OF MINISTERS ON BLANKS I AND II*

	0 shift			1 shift				2 shifts	
	L-L	I-I	D-D	L-I	I-D	I-L	D-I	L-D	D-L
<i>Occupations</i>									
Architect	32	27	5	5	7	12	7	5	2
Army officer	12	20	42	3	10	3	10	0	0
Artist	15	41	10	15	2	12	3	0	3
Astronomer	49	18	2	3	3	12	3	5	0
Athletic director	29	31	10	7	3	9	9	2	2
Auctioneer	3	10	54	3	9	2	12	2	5
Auto salesman	8	21	39	2	13	2	10	5	0
Auto repairman	17	20	33	3	12	7	8	0	0
Aviator	9	23	31	7	21	5	5	0	0
Auto racer	2	7	68	0	13	2	9	0	0
Average	17	22	29	5	9	6	8	2	1
Summary		68					28		3
<i>Amusements</i>									
Golf	35	28	5	3	3	22	3	0	0
Fishing	50	20	5	5	2	13	5	0	0
Tennis	62	15	2	5	3	10	2	2	0
Driving auto	77	2	3	2	0	11	5	0	0
Long walks	65	18	0	0	5	10	0	0	2
Checkers	31	28	11	8	7	10	5	0	0
Chess	30	26	18	5	8	10	2	0	2
Poker	7	30	41	3	10	3	5	0	0
Solitaire	10	25	38	3	13	5	3	3	0
Billiards	43	12	10	7	7	15	3	2	2
Average	41	20	13	4	6	11	3	1	0
Summary		75					24		1
<i>School Subjects</i>									
Art	21	35	5	9	2	18	5	0	5
Botany	47	23	5	5	4	9	5	2	0
Chemistry	45	16	7	9	7	9	5	2	2
Civics	64	17	5	7	0	7	0	0	0
Economics	52	14	0	10	5	17	0	2	0
English composition	52	12	7	2	0	15	9	2	2
Geology	69	16	0	10	0	10	0	0	2
History	90	2	0	2	2	3	2	0	0
Ancient languages	57	9	10	3	3	9	9	0	0
Modern languages	46	19	7	3	3	14	5	0	3
Average	54	16	5	6	3	11	4	1	1
Summary		75					23		2

*In order to simplify the appearance of this table all percentages are given to the nearest whole number. This explains apparent inconsistencies between averages and summaries.

TABLE 2 (*cont.*)
RESPONSES OF MINISTERS ON BLANKS I AND II

	0 shift				1 shift			2 shifts	
	L-L	I-I	D-D	L-I	I-D	I-L	D-I	L-D	D-L
<i>Activities</i>									
Repairing electric wiring	23	25	18	10	8	7	8	2	0
Cabinet-making	21	35	21	2	7	9	5	2	0
Arguments	48	7	23	5	5	7	3	2	0
Organizing a play	36	22	7	0	14	10	5	3	2
Opening a conversation with a stranger	45	15	10	10	2	10	7	2	0
Taking responsibility	82	2	2	10	2	2	2	0	0
Meeting new situations	73	2	2	10	2	8	0	2	2
Meeting and directing people	70	3	0	10	0	9	3	3	2
Adjusting difficulties of others	63	7	3	9	2	7	2	3	5
Being left to one's self	25	25	2	10	10	15	3	8	3
Average	49	14	9	7	5	8	4	3	1
Summary		71					25		4
<i>Personalities</i>									
Cautious people	25	25	2	10	10	15	3	8	3
Nervous people	5	30	15	0	15	12	17	0	7
Sick people	48	27	3	13	0	7	0	2	0
Very old people	53	19	0	10	3	13	0	3	0
Cripples	47	17	2	13	7	7	5	2	2
Side show freaks	2	5	72	0	8	0	10	0	3
People with gold teeth	2	38	36	2	6	0	16	0	0
People with protruding jaws	2	26	25	2	10	5	28	0	3
People with hooked noses	2	44	16	2	10	5	16	2	3
Blind people	34	32	7	9	5	12	2	0	0
Average	22	26	18	6	7	8	10	2	2
Summary		66					31		4
Average of 50 items	37	20	16	6	6	9	6	2	1
Summary of 50 items		71					26		3

contrast to these figures are the following from 17 occupations: 36% on the average like the work of the above groups, 32% are indifferent, and 32% dislike such work. There are, however, some occupational groups who are not so enthusiastic about their own work. In the case of office clerks, for example, only 19% like their work, 36% are indifferent, and 45% dislike it.

Anyone looking over the blanks is struck by the great number of comments jotted down by ministers, exhibiting a noticeable interest in *themselves*. This is in striking contrast to the blanks filled out by C. P. A.'s, who rarely made a notation of any sort. It seems very hard for ministers to refrain from explaining their reactions. One blank especially was so covered with explanations and comments that it was almost impossible to score it.

On the cover of the Strong Revision of the blank there is a line which reads, "What occupations have you frequently day-dreamed of entering?" That line proved the open sesame to the confidence of most of the subjects. Few failed to expatiate on hopes once cherished which life had pushed into the background, or, in the case of the younger subjects, of aspirations which they expected life to fulfil. In the case of the ministers, the occupations most frequently mentioned here beside the ministry were writing or lecturing. As one expressed it, "Ah! POETRY! Or any form of creative writing!" This part of the questionnaire proved valuable in giving an insight into maladjustments. One minister who scored —32 for minister's interests confided that he had always dreamed of being a "locomotive engineer."

RELIABILITY OF INTEREST TESTS

Cowdery reported 15 correlations between .66 and .91 for reliability of his blank as based on 5 different groups of men when scored for the 3 professional interests of law, engineering, and medicine. They were obtained by calculating the coefficients of correlation between the scores obtained by using the odd-numbered items, on the one hand, and the even-numbered items, on the other hand, and then applying the Brown-Spearman correction formula.

The correlations in Table 1 measure reliability of this test in a different way. Here two reactions to 176 items are contrasted with an interval of a year and a half intervening. As Cowdery's blank has 50% more items (263 instead of 176) and Strong's blank has 140% more items (420), the reliability of these blanks will presumably be found to be somewhat higher than the correlations in Table 1 suggest. A more extensive investigation of reliability of interest tests will be reported at a later time.

CONCLUSION

1) A marked degree of permanence (correlation between .74 and .90) was found for interests over a period of a year and a half in the case of adult ministers and certified public accountants. In the two tests the 176

items which were considered appeared on two different blanks, not in the same order, and accompanied by 87 other items, in the first case, and by 244 other items, in the second case.

2) The degree of permanence measured is much higher than a chance scoring of the blank would yield.

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WHY AN INSTINCT-HYPOTHESIS?¹

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It is important for theoretical and practical psychology that we should be able to tell as nearly as possible whether a given activity is due to something innate, to something acquired, or to a combination of the two, and also to know to what extent the two are involved, if neither can be singled out as the sole cause of the activity. In order to make any factual statement concerning the relative importance of nature and nurture, we shall first need a large amount of careful experimentation by unbiased investigators, a revamping of existing terminology, discrimination in the use of inference from animal behavior, and controlled genetic studies of human beings. This is a lengthy and difficult task for the experimentalist, and as a consequence we must consider upon what our present-day education is to be based in the meantime, for a perusal of any text on educational psychology would indicate that psychologists and educators alike think the foundations of education should rest on a knowledge of the original equipment of the child. Unfortunately, however, there is so little agreement among them as to just what is original and what is acquired that a study of the various present-day instinct theories leaves the student wondering about the value of any of them as a guide to educational procedure.

Although we do not wish to minimize the ultimate importance of the nature-nurture problem, it may be well to consider whether for practical purposes the importance of disentangling innate and habit drives is as great as it at first appears. Since there is so little agreement on the relative weightings of these two factors, and since experimental evidence on the problem is accumulating so slowly, we wish to raise the question whether it is not possible to learn something of educational value regarding the tendencies of the human being without necessarily involving any assump-

¹The author acknowledges the helpful criticism of Professor Lewis M. Terman in the preparation of this paper.

tion as to whether such tendencies are due to nature or to nurture. Since there seems to be fair agreement among psychologists as to the existence in school children of certain specific tendencies, tendencies which they have attempted to explain from their different viewpoints, we wish to ask whether these various and more or less generally defined and accepted tendencies cannot be salvaged from the smoke-screen of controversy and philosophical wrangling and be made to do service under some term which connotes nothing regarding the nature of their origin. In this paper the word "tendency" is used for this purpose. It will denote both the so-called instinctive and habit drives and will carry no interpretative connotation.

Until the nature-nurture problem is completely solved, we cannot know whether the position of Watson, of McDougall, or of some other theorist is most nearly in accord with the facts. At present there is not enough experimental evidence either to prove or to disprove any of the theories which have been put forth as explanatory hypotheses of human behavior. Until such experiments shall have been made, we propose that the activities of the schoolchild be studied as they are found, regardless of what their origin may have been. Surely it is better for the educator to have knowledge of the actually observed tendencies of children than to remain confused, as he now is, by the current theories of instinct. Although these theories attempt to interpret the same behavior, there is little agreement as to classification or origin, little emphasis on the functioning of specific tendencies, and not much in the way of help regarding their practical application to the educational process. There is much to be found about maturation and modifiability in general, but almost no information as to the best methods of applying these principles in the case of specific activities.

Certainly the educator needs experimental knowledge of the tendencies to action which are found in the schoolchild. He should know under what stimulating conditions various tendencies become realized in behavior, how strong the stimuli must be, and how the stimuli may vary from individual to individual and within the same individual from time to time; he should have some information concerning how they act and what mechanisms are predominant; he should have evidence as to the time at which the specific tendencies ordinarily come into action, when they are most powerful, and when they begin to wane; he should have data on the relative strength, modifiability, and variability of the activities; and, lastly, he must have some definite knowledge as to the relation of such tendencies to the learning process.

This immediately raises the question as to how such tendencies shall be studied. The answer is fairly obvious, since it does not seem likely that much light can be thrown on human tendencies by animal studies, nor that observations of the random activities of infants can ever be of any great value for the understanding of the later behavior of human beings. The logical subjects of such study are human beings between the ages of 4 and

18 years, since these ages are of prime interest to the educator. Experimental situations could be devised to isolate and test the existence of a specific tendency for a particular age, and at the same time give information as to the effective stimuli, and the possible variation of stimuli, that will call forth the tendency. Both genetic and cross-sectional studies should be made in an endeavor to test the reality of the various tendencies to action which psychologists have claimed to exist, and to tell us when the found tendencies mature, when they are strongest, and when they wane or become submerged with other trends. Such work should be supplemented by careful all-round observation of the child in its everyday life.

When the existence of definite tendencies is demonstrated, and the age at which they are most significant determined, we shall need further experimentation to give us definite knowledge as to their modifiability. If a tendency is modifiable, the educator needs to know to what extent modification can be carried before there is danger of conflict with some other tendency; in what manner modification can be brought about; how enduring the resulting behavior will be; how one tendency can be used to influence or counteract another; how best to foster or destroy a tendency; and how the principles of modifiability can be applied in the schoolroom. Since education calls for the cultivation of certain tendencies, the redirecting of some, and the curbing of others, the principles of modifiability are of utmost importance for the educational process. This is particularly true in the case of the problem child.

Variability in given tendencies is also an important problem. To assume that there is a universal tendency, without taking into account individual differences or deviations, is as absurd as to assume that intelligence is possessed to an equal degree by all. The fact that a majority of children exhibit activity which might be termed curiosity does not justify the admonition to the teacher to "feed the child's curiosity," as there may be a wide range between those who have little of this trait and those who are so curious that they are constantly getting into trouble. The fact of individual differences necessitates the application of the test method. By this we do not necessarily mean pencil and paper tests, although these are often useful, but rather test *situations* experimentally produced in the laboratory, on the playground, or in the classroom. If the existence of tendencies to action can be demonstrated, it should be possible to get a quantitative measure of their functioning or of the results of their operation. To be sure, such measurement would be relative to the group, rather than absolute, but this is not a serious handicap, since measurement in all the sciences is relative. Test situations could be devised which would place a given individual in a position relative to the group so that it could be said whether he was average, or to what degree he deviated above or below the average. This would be of very great practical value, since it would insure the early detection of those children who deviate to extreme degrees and thus

give the educator an opportunity to build up the desirable or curb the undesirable tendencies by some method of conditioning. Careful clinical studies of such extremes would also throw considerable light on the origin of the tendency, and if the test method were applied under different environmental conditions, it might aid in solving the relative influence of nature and nurture. Supplemented by the psychogalvanic technique, this method would be useful in the study of emotional tendencies and in determining relative strength of various activity trends.

It is admitted that difficult obstacles are encountered in attempting to test non-intellectual traits, particularly in the isolation of the tendency to be measured and the establishment of satisfactory criteria. Nevertheless, to judge by the steady advance in methods of testing personality, we can reasonably expect techniques to be developed that can be used to advantage in the study of the so-called instincts. The mental test, now firmly established as a psychological method, will find here one of its most useful applications.

Before going further it may be well to inquire what tendencies are to be studied. The answer is simple—*those tendencies which are found to exist in the schoolchild*. As proving their existence is one of the main problems, we would suggest starting tentatively with those which are most generally accepted by psychologists. Perhaps some such compilation as that of Bernard (3) would serve to indicate those most generally accepted, i.e., acquisitiveness, collecting and hoarding, ownership, fear, escape, hunting, gregariousness, curiosity, imitation, play, anger, self-abasement or submission, ascendancy, fighting, expansion, self-preservation, self-display, sexuality, constructiveness, creativeness, dramatic and artistic tendencies, altruism, sympathy, sociality, and rivalry. Many others could be included, but the above list contains those activities most frequently mentioned by psychologists as involving instinctive or habit drives.

Having obtained this provisional list, we should next try to discover whether any tests already standardized are suitable for measuring any of the tendencies, or whether they suggest other tests that might be useful. Some work of this type does exist. For example, Allport (2) has devised an ascendancy-submission test which might be extended downward to be used with children; Hsia (7) has constructed and used a sociability test in a study of elementary school children; Allen (1) has used the word-association technique to study 10 instincts, and has concluded that relative strength of certain tendencies can be determined by this method. Lehman and others (8-13) have devised a play quiz, and by its use have collected some interesting information, for example, it was found that only 10% of 5,000 Kansas school children engaged in collecting and hoarding. A test of aggressiveness has been developed by Moore and Gilliland (5-6). Moore (14) has suggested a method of testing the strength of instincts by the word-association method in which the response is to be a verb, the resulting score throwing light on various action tendencies. Collman and McRae (4) have

attempted to measure the relative strength of instincts by association technique and psychogalvanic apparatus. The citations in this paragraph are by no means exhaustive of the literature in this field, but are merely illustrative.

Once the existence of particular tendencies is demonstrated, and their modifiability and variability known, we need to go further and learn more specifically how these various tendencies function in the educational process. Information as to their possible use in motivation would of course be of great value, while a knowledge of their rôle in social control would be useful in directing the social life of the pupil. Given tests which would measure the so-called instinctive and emotional trends, one could apply the correlation technique to determine what tendencies are related to learning or school success, and it is conceivable that a battery of such tests combined with tests for general intelligence would improve present prediction of school success and thereby provide a more adequate guide for classifying pupils than we now have.

Summarizing, we may say that a study of the literature on instinct shows so little application of theory to practical educational problems that we are forced to conclude that instead of more theory we need more experimentation on found or observed tendencies. We have briefly indicated certain aspects of the problem which could be profitably investigated and have suggested some possible procedures. We need less speculation as to what may be attributed to nature and what to nurture, and in its place more effort directed toward the measurement and description of observable tendencies of whatever origin. Later we may apply our methods to the inductive determination of the influence of various environmental factors.

In a word, our thesis is that what educational psychology most needs is not an instinct hypothesis, but more information about recognized and observable tendencies.

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Stanford University
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A SAMPLING OF STUDENT OPINION

RAYMOND R. WILLOUGHBY

A questionnaire presented to the student body of Stanford University by the *Daily* (student newspaper) in April, 1928, and answered by slightly over 800 students (approximately one-fourth of the student body), makes possible an analytical estimate of certain aspects of student opinion.

The questions were as follows:

1. Will the (presidential) candidate's stand on prohibition in any way influence your vote?
2. Will the candidate's religion in any way influence your vote?
3. Do you consider that the League of Nations has been successful?
4. Do you believe that the United States should be a League member?
5. Do you justify American intervention in Nicaragua?
6. Do you favor any form of trial marriage?
7. At what age do you expect to marry?
8. Do you believe in the single or double standard of morality?
9. Do you think you are getting your "money's worth" from college?
10. If doing it over again, would you choose to come to college?
11. Would you prefer a block S (athletic accomplishment) to a Phi Beta Kappa key?
12. Has college affected your view on religion?
13. If yes, how? Toward greater faith or greater skepticism?
14. Your present status in regard to religion.
15. If you were making a choice, which régime would you prefer to live under, Fascism or Bolshevism?
16. Do you believe that the United States should recognize Soviet Russia?
17. In respect to the pictures you have seen in the last year do you con-

sider motion pictures have become better, worse, or remained the same?

18. What's your latest opinion on prohibition?

19. Have you observed within the last few years any change in college drinking conditions?

20. Which do you consider the most desirable for life work after you have graduated from college, business or a profession?

The questions were classified as yielding information on sex (6, 7, 8), religion (2, 12, 13, 14), prohibition (1, 18, 19), politics (3, 4, 5, 15, 16), college (9, 10, 11), vocation (20), and amusement (17).

It was hoped to secure some light on the following questions:

1. Is the graduate different as to his opinions?

2. Is the freshman different?

3. Are there striking sex differences?

4. Are there striking reversals?

5. Are there marked instances of unanimity or discrepancy?

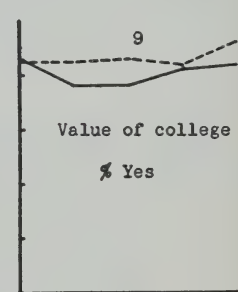
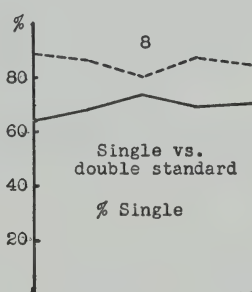
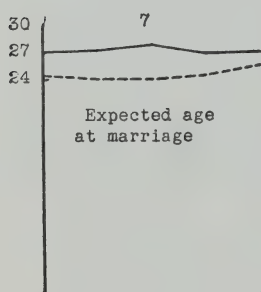
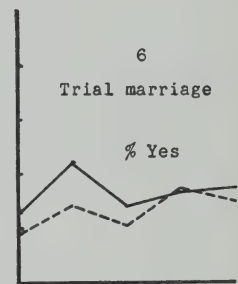
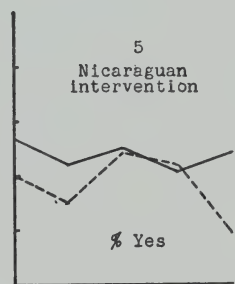
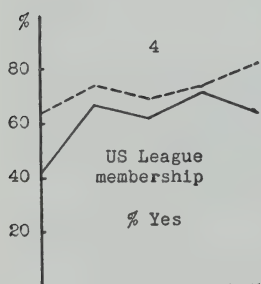
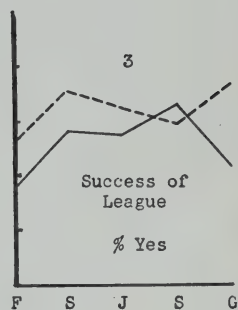
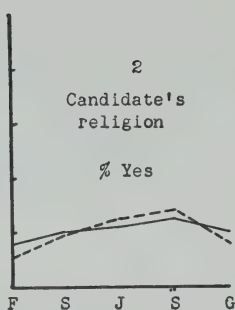
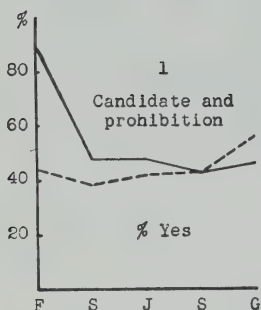
6. Are there systematic shifts in opinion, such, for instance, as might reasonably be ascribed to liberalizing influences?

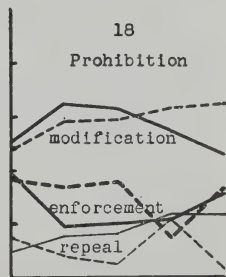
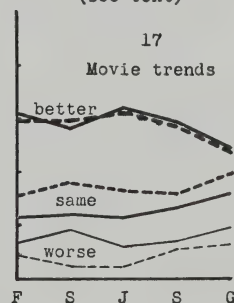
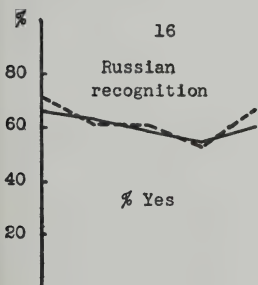
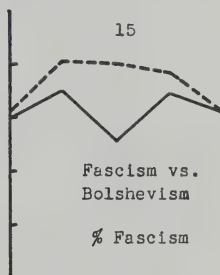
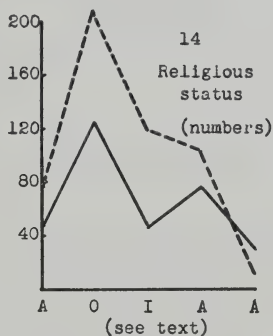
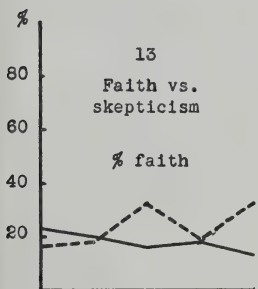
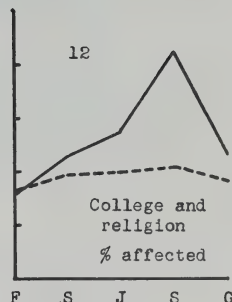
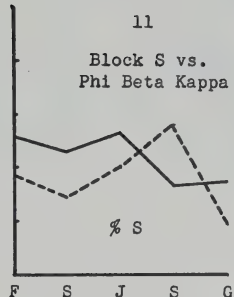
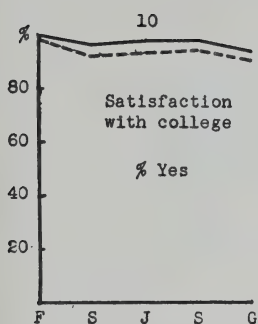
The data are presented graphically, as in that form they are more easily interpretable than in tables; the abscissae represent the 5 successive academic grades in order, except in 14, where the successive points are Active church member, Occasional churchgoer, Indifferent, Agnostic, and Atheist. Ordinates represent percentages of the total number of respondents of each group answering the question in the way specified, except in 7, where they refer to age, and in 14, where they refer to numbers. Women's opinions are represented by dashed, men's by full lines. In interpreting the graphs it is desirable to keep in mind that the standard errors of the percentages are about 4-5% for a population of 100; the actual populations are about half this for the graduates, but run up to 150 for the freshmen; they also vary with the question. Although there is no appropriate mathematical expression for it, weight should also be given to the existence of a trend.

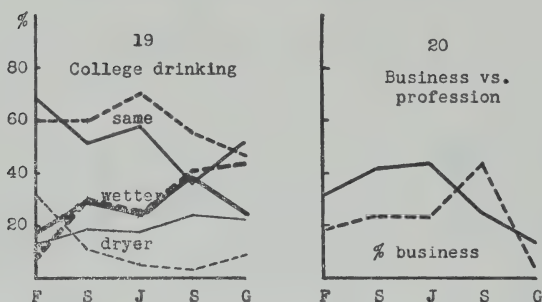
The graduate does not appear to differ markedly from his younger associates; the answers to the question "Different?" are tabulated by field of opinion:

Sex: 6, no; 7, no; 8, no.	No
Religion: 2, no; 12, no; 13, no; 14, —	No
Prohibition: 1, no; 18, no; 19, yes?	No
Politics: 3, no; 4, yes? 5, yes? 15, no; 16, no.	No?
College: 9, no; 10, yes? 11, yes?	Yes?
Vocation: 20, yes.	Yes
Amusement: 17, yes?	Yes?

The slight differences that do occur appear to reflect an increased disillusionment and a normal selection of graduates for professional training.







The freshman also shows no marked differences:

Sex: 6, yes? 7, no; 8, no.	No
Religion: 2, yes; 12, yes? 13, no.	Yes?
Prohibition: 1, yes; 18, yes? 19, no?	Yes?
Politics: 3, yes; 4, yes; 5, no; 15, no; 16, yes.	Yes
College: 9, no; 10, yes; 11, no.	No
Vocation: 20, no.	No
Amusement: 17, no.	No

The differences appear to be wholly describable as a greater degree of conservatism.

There are, on the other hand, rather striking sex differences; the initial tabulated is that of the more conservative sex:

Sex: 6, W; 7, W; 8 (W marry earlier).	W
Religion: 2, 0; 12, W; 13, 0.	W
Prohibition: 1, M; 18, 0; 19, W.	W
Politics: 3, W; 4, W; 5, M*; 15, W; 16, 0.	W
College: 9, W; 10, M; 11, M.	M
Vocation: 20, W.	W
Amusement: 17, W.	W

Besides these general differences, there is a notable difference in slope between the sexes in 12; the men are evidently very much more affected as to their religious views by the progressive exposure to college than are the women. Also, the freshman men are much more impressed by the views of a candidate on prohibition than are the women; a disappearing difference on the success of the League of Nations is reactivated among the graduates; more freshman men than women want the United States to stay out of the League; there is a curious phenomenon in 8, where the sexes draw regularly together till their junior year, but in the senior year draw apart again. Other suggestions may be found by a study of the graphs.

*Not strictly classifiable as to conservatism.

There are marked reversals associated with having graduated in 2, 3, 5, 11, 12, 16; they seem to be associated with greater liberalism, with exceptions (12); in 11, removal of the personal aspect of the question seems to affect the opinion. There is a marked change associated with the senior year in 20, business becoming less attractive to the men and more so to the women.

There are marked sex unities in the question on the candidate's religion, on Russian recognition, and on the question of coming to college if the decision were to be made again. Unities among the classes are conspicuous on the single standard, age at marriage, value of college, and faith *vs.* skepticism. There are class discrepancies of some magnitude on the candidate's prohibition views, the League of Nations, trial marriage, business *vs.* profession, and drinking conditions.

There appear to be traces of a systematic shift of opinion with longer academic experience, particularly in the direction of liberalism. The tabulated figures are for trends toward liberal (L) or conservative (C) with academic promotion:

Sex: 6, L; 7, 0; 8,—	L
Religion: 2, C; 12, L; 13, 0.	0?
Prohibition: 1, L? 18, L? 19 L*.	L?
Politics: 3, L; 4, L; 5, L; 15, L? 16, C.	L
College: 9, 0; 10, 0; 11, 0.	0
Vocation: 20, C?	C?
Amusement: 17, L*.	L*

The factor of weight or proportion of opinion does not lend itself to quantitative evaluation, but may be estimated from an inspection of the graphs. Thus, from 9 and 10 it appears that there is relatively little discontent with the academic situation, while from 13 it appears that the bulk of changes in religious viewpoint are in the direction of greater skepticism.

In summary, the most outstanding facts evident from this self-evaluation of student opinion are those of marked sex difference in most issues and of a noticeable trend toward liberalism with increasing exposure to academic influences.

*Not strictly classifiable as to conservatism.

BOOKS

FOREL, A. *The Social World of the Ants Compared with That of Man.* (Trans. by C. K. Ogden.) 2 vols. London; New York: Putnam's, 1928. Pp. xxx+551; 445. 24 plates; 738 text-figures.

This work is a notable achievement as the last important contribution to biology by the last of a long line of illustrious Swiss naturalists, beginning with Charles Bonnet and including Trembley, François, and Pierre Huber, and more than one generation of de Candolles, de Saussures, and Agassiz. The original French edition, which was issued in parts in 1921-1923 by the Librairie Kundig of Geneva, though very attractively printed, contained quite a number of inaccuracies. The present edition has been most fortunate in its translator, Mr. C. K. Ogden, the distinguished editor of *Psyche* and the "International Library of Psychology, Philosophy and Scientific Method." His language is so fluent, lucid, and idiomatic and his rendering of technical terms so skillful that the work has all the appearance of having been composed in English. Many of the errors in the French edition have been conscientiously corrected, and an adequate index has been provided, so that this edition, quite apart from its larger letter-press and pages, is decidedly superior to the original. Among the profuse illustrations, the colored and black and white plates drawn by E. W. Heinrich are exceptionally beautiful and accurate. Many of them, in fact are more life-like than any ant-illustrations published heretofore. Especially the two plates X and XI, representing ant-battles, are drawn with such unusual insight and courage that, by comparison, the attempts of previous draughtsmen to depict similar scenes seem very crude.

The significance of the "Social World of Ants" can be fully appreciated only by the myrmecologist who has enjoyed intimate personal acquaintance with its author. Auguste Forel was born in 1848 and began to study ants and other insects before his eighth year. The observations which he made during his childhood and youth were brought together and published in 1874 as a quarto volume, the "Fourmis de la Suisse," which is one of the landmarks of myrmecology, and has lost none of its value during all the years that have since elapsed. This was only the beginning of his penetrating studies of the ants, which were carried on without interruption till 1922, when illness and failing eyesight compelled him to write his last myrmecological paper and to dispose of his very valuable collections to the Museum of Geneva. Since 1874 he has published hundreds of important monographs and notes, containing descriptions of several thousand species, subspecies and varieties from all parts of the world and treating of every aspect of ant-structure, distribution, psychology, and behavior. But all this was only a delightful avocation! He was at the same time one of the

foremost European neurologists, practicing psychiatrists, and social reformers. His publications in these capacities, as listed by some of his Viennese friends and admirers on his 60th birthday, comprise 10 important works on brain anatomy, 31 on normal psychology, sleep, hypnotism, and suggestion, 23 on psychiatric and criminal psychology, 34 on the deleterious effects of alcohol, 11 on sex and social ethics. His long experience as a psychiatrist, at one time as the director of the large hospital for the insane at Zürich, and since in private practice, his untiring, sympathetic, and unselfish devotion to his patients of all social classes, his extraordinary intuition, coupled with a singularly ardent and straightforward personality, yielded him a rare knowledge of his fellow men. So comprehensive and penetrating was his insight into human behavior that there is scarcely one of its protean aspects which he has not touched upon with illuminating comment in his publications.

Of course, the work of such a man on ants must be decidedly worth reading. In the first place, it summarizes the whole of myrmecology as it has developed from the middle of the 18th century to about 1920. This Forel readily accomplished not only because he was familiar with all the pertinent literature but because he himself had been one of the most enthusiastic contributors to the advancement of the science. His example inspired a number of young men to take up the study, and these, now become a small army of workers, trained in up-to-date methods of investigation, are inaugurating a new *quantitative* era in myrmecology. We may say, therefore, that Forel's work summarizes and concludes the *qualitative*, or natural history period of myrmecological investigation from Réaumur (1744) and Gould (1747) to about 1920.

But Forel's two volumes on the "Social World of Ants" are more than a digest of our knowledge of the ants. His daily preoccupation during a long life with the problems of the greatest of social animals could hardly fail to find expression in such a work. This is indicated in the sub-title "compared with that of man," and justifies the digressions, which seem to have irritated some previous reviewers. These digressions are really of peculiar interest, because they reveal the conclusions reached by a very acute intellect after long study of insect behavior under normal conditions and of the effects of abnormal stimuli both internal and social on the more unstable individuals of our own species. Hence the emphasis on sex, alcoholism, and the numerous maladjustments incident to our modern industrial and political environment, and our woefully antiquated ethics, educational, and religious institutions.

No adequate review of the vast amount of myrmecological data in Forel's two volumes can be undertaken in this review. These data, moreover, which derive much of their significance from their very mass and intricacy, are probably of less interest to the readers of this journal than the author's interpretation of insect behavior and conception of the basic resemblances

and differences between formicine and human societies. As a rule, sociologists take little interest in animal societies, and it must be admitted that a knowledge of these is of slight practical importance. But the fact is of great theoretical interest that insect societies, evolving during the long eons of geological time from social rudiments like the simple family, have acquired a more highly integrated structure than that of man, though the component individuals exhibit a maximum of irrational, or "instinctive" and only a minimum of what we are pleased to call "intelligent" behavior. This may at least direct our attention to the two corresponding aspects of human behavior, and perhaps lead us to suspect that we have been grossly misestimating the relative importance of the rational and irrational in human societies.

During the past two centuries, interpretations of ant-behavior have swung like a pendulum from one extreme position to the other. To the 18th and early 19th century naturalists, ants seemed like diminutive reasoning human beings. By the close of the latter century they had come to be interpreted as purely tropistic and reflex machines (Bethe and others). Now opinion has swung back part way to regarding their behavior as being in some degree intelligent (plastic), but as in great part reflex (automatic). Forel was one of the first to adopt this position in the 70's and 80's of the last century, and all observers of ants and other insects have since accepted essentially the same interpretation. Such differences of opinion as exist are very largely terminological. On the publication of Semon's "Mneme," Forel, and later Brun, adopted its nomenclature with enthusiasm. As will be seen from the following quotation (vol. 1, p. 425), "intelligence" is used by Forel in the modern sense of "behavioristic adaptability" and not in the scholastic sense as a synonym of "ratiocination," or drawing conclusions from premises,

"We have been admiring the marvels of adapted instinct and their economy. In these facts, betraying the meticulous adaptation of causes to their effects, some people find proof of an Intelligence in the Universe, divine, supreme and personal. They forget that the word 'intelligence' is only an abstract term extracted from our meagre human intelligence, and that they are only moving in a vicious circle. Science proves simply that all animal and vegetable life forms and develops in phylogenesis, as well as in ontogenesis, by the accumulated inheritance of characters which living beings have acquired, second by second, day by day, year by year, millions of years by millions of years, owing to stimulation by the action of the external world, in other words, by the engrams they receive from these stimuli. It also proves that natural selection brings about a gradual detailed adaptation of the characters thus acquired to the various circumstances of this same external world. Thus it is that living organic 'nature' reacts upon the living beings which spring from her. We are at liberty, if it pleases us, to give such adaptations the name of 'intelligence,' a quality of our own whose range, in our immense vanity, we exaggerate. This intelli-

gence simply plays a part in the manifestations presented by living beings. But all the rest is only sophistical divagation on the unknowable 'Absolute First Cause of the Universe' which forms the object of the grandiloquent false science called metaphysics. Genuine science gives no reply to all this but the old dictum of Socrates, 'I know nothing about it.'"

"'Vanity of vanities, all is vanity,' cried Solomon, King of the Jews, so they tell us, shortly before his death. He was not thinking then of the ants, though he had held them up as an example to idle humanity, but of man, who in his vanity set himself up on the topmost peak of the Universe and announced that he was created in the image of a personal God of his own invention. In reality, all that man knows and all that he can know about the world which lies around him and from which he issues is revealed to him, not by a God whom he can never know, but through the mediation of the sensations which he owes to his sense organs. These sensations of ours are transmitted to our brains by our nerves; they are elaborated and compared with one another by the aid of our movements, after being conserved by means of the sensory images (engrams) engraved on our brains, and the recall (ecphory) of these images by memory. In this way, the brain, the organ of our mind, uses that mobile internal concentration of its activity which we call attention, to combine sensations and gradually transform them, in our thoughts and feelings, into perceptions, representations and abstractions. We use our language, perfected by writing, to give our most highly generalized abstractions the big, fine-sounding names out of which we afterwards build equally big systems, described as *metaphysical*. The vain authors of these systems claim that we ought to *believe* in them absolutely and that they represent the Absolute of the Universe, whether or not revealed by a man-made God. We need not here concern ourselves further with such matters.

"And as for the ants—except for the big metaphysical abstractions which their simple, unwritten antennal language does not enable them to conceive—very much the same things happen to them, in a general way at any rate. Their senses give them information about the external world. They combine these data by means of their movements and their brain. The brain conserves, combines and ecphorizes (recalls) by memory. None the less, there are differences. In their case, the ancestral engrams which have been fixed by heredity, and have thus become instinctive and innate are, relatively speaking, infinitely more considerable than they are in our own, and the engrams which are individually acquired and remembered during their shorter lives are infinitely less important. Yet they are certainly present, as we shall prove irrefutably by numerous precise experiments" (vol. 1, p. 177).

The rather limited range of intelligent behavior in ants is best seen in their reactions to their various parasites and guests. Since these reactions are required to meet unusual or inconstant environmental conditions, they

have all the value of natural experiments. Many of the parasites and guests are furnished with attractive odors, or alluring organs (trichomes, exudatoria), or structural and integumentary peculiarities which serve to persuade the ants to tolerate or even to feed and rear them. And since the consociation of the ants and guests commonly occurs in the dark chambers of the nest, many of the guests resort to a kind of behavioristic and tactile rather than to visual mimicry in deceiving their hosts. This leads Forel to digress on the influence of unconscious liars in human society (1, p. 267).

"There is also a singular mimicry of demeanor, consisting in the activity of the limbs, in the mutual antennal language that passes between the guest and its ant, in caressing the legs, in its manner of eating and allowing or causing itself to be carried about, etc., and this kind of mimicry is not the least successful means of deceiving the ants' social instinct in a fashion that is as hypocritical as it is unconscious.

"We must bear in mind, that among ourselves also the unconscious liar, the victim of hysteria, himself believes in the reality of the invented stories which his sick imagination drives him to tell us—as in the case of the late celebrity, Thérèse Humbert, for example. That is why unconscious liars or pathological swindlers lead us astray a hundred times more effectively than the conscious liar, who is aware that he is lying and afraid of betraying himself, and whose physiognomy, voice, and demeanor do, therefore, actually betray him. Since he believes in his fictions, the hysterical swindler, on the other hand, acts quite naturally; he enters into his part in good earnest, with all his heart, and all his artist's passion. Like a really good actor on his stage, he carries us with him, even to the verge of tears—just as the good symphile of our worthy ants leads them unconsciously by the nose, or rather by the antennae."

It is clear that all insect societies have arisen phylogenetically as single families. This stage is still repeated in the ontogeny of the annual societies of bumblebees and wasps and the perennial societies of ants and termites, but has been lost in the honeybees. Even these, however, retain the familial type of society, and no matter how many thousand individuals an insect society may eventually number, they are all offspring of one or a few mothers. Human societies, on the other hand, are not expanded families, nor have they had their origin in a single family as implied in Genesis, but seem to have arisen from mammalian consociations of the horde, pack, or herd type. The flocks of birds are evidently analogous, but independent developments. They are all protective, or defensive organizations, in which the individuals are ordered in an elaborate social hierarchy on the basis of their several, variable, psychophysical endowments. The great mobility of these societies, especially of those of man, depends therefore on an inherent instability of individual status, which in turn depends on the precarious and temporary ability of the individual to adjust his behavior to his more dominant as well as to his more submissive fellows. These tendencies

everywhere manifest themselves as what have been called the "instincts" of self-assertion and self-abasement and, in their more pronounced forms, as the ambivalent behavior which the psychoanalysts have called sadism and masochism, love and hate, the will to power and the will to death, etc. Recent studies of mammalian and avian associations show the importance of this "pecking order" as a social constraint and cohesive and its essential difference from the mutual exchange of food and chemical stimuli (trophalaxis) which holds the individuals of the insect society together. The following reflections in which Forel indulges are interesting and suggestive but seem not to emphasize sufficiently the extraordinary divergence of human and insect societies and the impossibility, to say nothing of the undesirability of our imitating the peculiar and highly specialized excellencies of formicine societies:

"The resemblance between a society of ants and a society of men is no mere matter of appearances, but more than the difference between them. Both depend on profound causes, hereditary or acquired, which we have now to analyze seriously.

"The great variability of their instincts, the generally omnivorous capacities of their digestion, the multiplicity of their species (nearly 4500, not counting races or varieties), their longevity, the relative stability of their colonies and their distribution over practically the whole world give the ants a great *social force* which other social insects possess in part only.

"The hereditary social instinct of ants permits them to live without chieftains, guides, police or laws, in an admirably coordinated state of anarchy; human beings are absolutely unable to do this and if they attempt as much they at once fall back into such a triumphant state of brigandage that they are compelled to submit once more to the rule of chieftains. Such is the ancient tragedy of humanity, a thousand times repeated throughout history (vol. 2, p. 336).

"A written tradition, even an antennal tradition corresponding to our oral tradition, is excluded in the case of all ants. And in spite of this fact, the social cosmos of a formicary is very much superior to our states, societies and federations, from the point of view of order, organization, and the social work of the united community. Why so?

"Well, dear reader, it is because man's hereditary nature, deep-rooted in his brain, makes him an egoistic, individualistic, fierce, domineering, tyrannical, jealous, passionate and revengeful being, who wishes to enjoy liberty by the abuse of his neighbour's toil. For the slightest social defects possessed by this neighbour he is argus-eyed, but he unconsciously misinterprets or extenuates his own faults. For his personal satisfaction alone he chooses a few friends or companions and one of several sexual help-meets. It is comparatively rare for even his family to be united. Yet there are some men, and more especially some women—though they are exceptional—it is true, who devote themselves to the social well-being of humanity and are

perpetually denying themselves for the sake of their neighbours; but the masses misunderstand and persecute them. Moreover, when they attain 'power' success intoxicates them and turns their heads; rare indeed are those who resist, keep their integrity and persevere to the end along the path of true social service. What must we do, then, to grow nearer to the ants and yet remain men?" (vol. 2, p. 356).

"Ants being anarchists and communists at the same time, realize the ideals of both Proudhon and Kropotkin for human society, but they do so by means of a natural instinct inherited during the egg-stage, such as we have no claim whatever to possess. Owning neither government, rulers nor laws, they all usually inhabit the same nest and common chambers. They do not indulge in family apartments, separate workrooms, personal attendants, kitchens, dining-rooms or bedrooms; the whole of their internal and domestic life, both that of the young and that of the adults, is conducted in common. Intimacies and family secrets, which must not be divulged, are also rarely found among them—for nearly all their nuptials take place in the open air. Their home life and its customs are therefore evolved by our little friends in the darkness of their common nest, and only occasionally at the surface, in the surrounding district or on roads which are also common property, for the ownership of land is socialized as completely as that of the means of production and consumption. Otherwise, what could be the significance of these means, among creatures whose individual bodies, even, have social stomachs incomparably larger than those which digest food for their precious selves? And you, friend reader—have you yourself thoroughly digested the above-mentioned consequences of communistic life among the ants? If you wish to understand their habits, you must certainly do so" (vol. 1, p. 375).

In the latter part of the first volume and in the "Epilogue," which is rather diffuse and seems to show signs of fatigue, Forel favors us with some philosophical and ethical digressions, which are interesting mainly because they prove that a very active, sincere, and socially useful man can obtain adequate inspiration from quite other than creedal sources, a fact which only the devout seem ever to have doubted.

"The ways of the Creator are unfathomable—so said our fathers. Our reply is that the ways of nature can be fathomed perfectly well, with perseverance and toil, by the human brain. The things that are, and always will be, unfathomable are the pseudo-problems of metaphysics, with their divagations into an alleged unknowable 'Absolute' of the Universe. Let us learn, therefore, to be content with the relations between this self of ours, a function of our brain, and the external world surrounding us. Let us bow in resignation before the unfathomable essence of the world, and before the hypothetical First Cause of wickedness and ugliness, as before that of the goodness and beauty, which we may discover at every step if we search carefully about our little planet. Let us admit that the notions of good and

bad, beautiful and ugly, are only relative to ourselves and our sensations. Let us imitate the ants of a single polycladic formicary; we shall then become more modest and sociable throughout the entire world by the federation of all peoples" (vol. 1, p. 372).

"Given the passions and weaknesses of man, however, we must fight with all our strength, by means of good legislation, against all the social causes which inflame our unwholesome passions—such as alcohol, narcotics, gambling, debauchery and luxury, for these are the worst hindrances to the social well-being of all in that peaceful federation of nations to which we must aspire. The *scientific religion of man's social well-being*—this must be the religion of the future, and, like that of the Bahais, it must be free from doctrine and from metaphysics, uniting all that is truly good and purely human in the ancient religions. As for a God incomprehensible to man, whom some believe they can know or feel, whom many adore and others fear or even curse, and whom many people bedeck with their human attributes—we may leave everyone free to adore this idea with whatever metaphysics he pleases. The religion of the social well-being of man has no concern with Him: neither have I seen His temple among the ants" (vol. 2, p. 351).

The last quotation shows that Forel should have been born in the United States. Had he been so fortunate, or so unfortunate, it is probable that he would now in his eighty-first year be the beloved honorary president of all our anti-saloon, anti-narcotic, anti-vice, anti-gambling, eugenic, birth-control, ethical, free-thought, social-betterment and other uplift organizations and that many of these would be saner and more efficient if he could have participated in their development during the past three decades, though his appeal to legislation sounds rather ominous.

The "Social World of Ants" closes with a 50-page appendix on the termites, written by Dr. E. Bugnion, Forel's brother-in-law and formerly professor of anatomy at the University of Lausanne. It is really a study of the development of the defensive instincts of the only social competitors of the ants among tropical and subtropical insects. Bugnion undertakes to show how the soft-bodied termites have acquired special structural and behavioristic devices for protecting themselves from the incessant inroads of the ants, which are their only implacable enemies apart from the birds that feed on their adult sexual forms during the dissemination flights and the edentate mammals that break open the termitaria and devour their inhabitants in all their developmental stages.

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HAMILTON, G. V. *A Research in Marriage*. New York: Boni, 1929. Pp. xii+570. \$10.00.

HAMILTON, G. V., & MACGOWAN, K. *What Is Wrong with Marriage?** New York: Boni, 1929. Pp. xxi+319. \$3.00.

A few years ago a fund was collected for the study of sex. I was asked to help plan a research program. It was quite a sizable sum. I went to work eagerly. When the committee met, I asked, more as a bit of pleasantry than anything else, "Is this to be a real study of sex, or are we going to study rats, rabbits, and guinea pigs again?" Very solemnly I was assured that it was rats, rabbits, guinea pigs or nothing. I tucked my plan into my pocket and went back to the office lamenting the fact that, while we were in the twentieth century in science we were still in the fourteenth century in folkways.

I might have known it was rabbits and guinea pigs. About 1900 Stanley Hall began a very valuable study of adolescence. From the appearance of his first article in a scientific psychological magazine—which antedated his book by several years—a whispering campaign began in university circles: "Have you read what Stanley Hall is putting out? Who is interested in that kind of stuff anyway? Hall must be a little bit queer."

Psychoanalysis had to come to this country—which it did in 1909 in the person of Freud and his colleagues, and incidentally they gave their lectures at Hall's own college, Clark University—before Hall's psychological colleagues woke up to the fact that a man may study sex and still be a scientist. The conventional public has not yet waked up to this fact. The study of sex is still fraught with danger. It can be openly studied only by individuals who are not connected with universities.

What a confession to make! It is admittedly the most important subject in life. It is admittedly the thing which causes the most shipwrecks in the happiness of men and women. And yet our scientific information is so meager. Even the few facts we have must be looked upon as more or less bootleg stuff. Those of us who try to salvage some of the shipwrecks need to have a thousand questions answered before we can guide other human beings intelligently. And we want them answered not by our mothers and grandmothers, not by priests and clergymen in the interest of middle-aged mores, not by general practitioners, not even by Freudians; we do want them answered by scientifically trained students of sex who can approach their problems with human beings as objectively as they would approach the problem of reproduction in the amoeba.

We all welcome Hamilton's and Macgowan's book. It is the best approach and the most objective approach we have so far to the study of marriage. Even Westermarck's colossal volumes on marriage, tinged as they

*This review is printed jointly as the introduction to "What Is Wrong with Marriage?" (Ed.)

are by religion, mysticism and wish-fulfillments, must be relegated to a lower shelf. Even Sumner's "Folk Ways" somehow loses its pep because the present volume deals with your 1929 problems and mine, and not with those of yesteryear.

It is a perfectly feasible project to select a group of married people and to ask questions about how the institution is working. So Hamilton and Macgowan start with one hundred married men and one hundred married women. Not all of the hundred women were married to these particular married men. It required about four years to make the study on even two hundred people. It was a much harder job to get the confidence of these two hundred people—get them to the point where they would tell the truth—and yet this was done. The reports impress the reader as being sincere; so much was told that there would have been no point in holding anything else back. The procedure adopted was very simple. Four hundred questions on cards were stacked near the individual. He picked up the first one and read it—e.g., "What is there in your marriage that is especially unsatisfactory to you?" Then he or she began to talk it out, the examiner writing down all that was said. The examiner asked no questions. When all two hundred persons had answered all of the several hundred questions, the work of tabulating began.

Some thirteen questions were asked in order to classify the person as being happily or unhappily married. They ran along these lines: "What in your marriage do you object to?" "How long after your marriage did you begin to be dissatisfied?" "Do you wish to go on living with your spouse?" "If by some miracle you could press a button and find that you weren't married, would you press the button?" "Would you marry if you were unmarried?" "What things in your married life annoy and dissatisfy you most?"

The high spot result is that only twenty-nine of the one hundred men and twenty-one of the one hundred women are unequivocally successfully married. Twenty-two of the rest of the men and twenty-four of the women are successfully married with qualifications. Thirty-six of the men and forty-one of the women had hopeless marriages.

Many other general questions were asked in the hope of finding the reasons why people have made such a wreck of married happiness. We can only raise a few of them: Has the length of the marriage period any bearing on the success of the marriage? The relative ages of spouses? The husband's and wife's education, income, and occupation?

The high spots from these questions show that those marriages taking place between 1921 and 1925 show the greatest number of successful marriages. This was to be expected—the honeymoon was barely over. Again the chances for success in marriage are increased as men and women marry later and later in life—at least up to age thirty-five. The unhappiest group are the women who marry before twenty-five (a conclusion which is sadly in need of a fuller explanation than the authors give it). If a young

woman marries a man considerably older, she is likely to be happy, but the man is likely to get tired more quickly than she. If marriage takes place between a man and a woman much older than himself there is little chance for success. Among college graduates, marriage is only of average success. Where a spouse goes to college but does not graduate, the marriage chance is way below the average. If, however, the wife's education is superior to that of the man the chance is good, but not *vice versa*. The astonishing thing is that a marriage has a much greater chance for success if neither husband nor wife attended college—a rather sad commentary on the colleges. Size of income plays relatively a minor rôle in the happiness of men. But the women—sad to relate, wives of richer husbands are far happier than the wives of poorer husbands.

Next we come to intimate details of why marriage is unsatisfactory. Thirty-seven women and forty-nine men complained of temperamental dissatisfaction—this led the list, which would seem to give a real justification for divorce on grounds of temperamental differences. Sexual dissatisfaction was next. It brought thirty women and thirty-nine men into the complaint stand. Lack of personal freedom was next, with eighteen women and ten men as complaining witnesses. Jealousy caused eleven women and eight men to complain. Troubles over children, seven women and eight men. Frictions over relatives, only four women and seven men—maybe the mother-in-law is not so bad as has been painted after all. And wonder of wonders, only three women and no men complained of the demon rum.

Surely every judge who has to deal with divorce, every legislator who helps to frame our ridiculous divorce laws, every lawyer who has to handle divorce cases, and every registered voter who may be called upon at some time to sit on the jury of a divorce case must read these chapters if we are ever going to be able to think intelligently about the marriage relationship.

The research does not stop here. Searching questions which bring out hidden causes of unhappiness are relentlessly asked: What is the effect of extra-marital sex intercourse upon chances of marital happiness when the men have engaged in it? When the women have entered into it? How many women ever successfully reach a successful sex climax in marriage and can they be happy in marriage without it? Why do so few women—only fifty-four out of one hundred women (and I believe this far too high) ever reach the sex climax—is it due to physiological factors, man's ineptness or early training of the mother? What of masturbation? Is extra-marital intercourse increasing—among the men—among the women? And in this last group of answers, or shall we say confessions, we run upon the most startling fact brought out in the book. Men are just a bit steadier under the marriage yoke than the women. Women married during the last decade or so are quite experimental. Extra-marital experimentation is becoming quite general (I am sorry the authors have to use the word "adultery"). But on these things which so intimately touch the lives of all of us the

authors must speak for themselves. All I can say is that I am thankful that I am neither a priest nor a moralist who has to uphold a non-changing mores. I am neither shocked nor grieved by what Hamilton and Macgowan bring out, but I am intensely interested. Their facts, developed so dispassionately, help to steer me in my relations with my friends and acquaintances. I can say fervently, I thank my everlasting chromosomes, who are without beginning and without end, that I do not have to pass judgment upon my fellowman. I have only to understand him.

The research student who reads this book will probably want to ask a few questions. Should the psychiatrist himself have selected the hundred men and the hundred women? Hamilton admits that he exercised a certain selection—"but they were special cases of normality and they were intelligent and articulate." Yet over in the chapter on "The Skeleton at the Feast" the authors state quite frankly that only fifty-four of the married women had ever in their lives reached the sexual climax and that twenty-four of the forty-six women who never experienced the climax were distinctly neurotic. Even though they admit that they were not seeking a cross section of humanity, would it not possibly have been better to have had Dr. Adolph Meyer select a group, Dr. Kirby a group, Dr. Tilney a group, Dr. Timme a group, and so on. It seems to me that this would have insured a little more objective selection of material. We are so prone always to select the people we continue to meet on the basis of our own biases.

It would have been rather interesting to have changed the technique for getting answers to certain questions. The examiner handed the question to a subject on a typewritten card. The subject read the question and was later questioned about it. He had to give the answer verbally to the examiner. No matter how emancipated a person may be, there are questions which are probably never answered wholly truthfully if the answerer can be checked up. For example, one of the question was, "If you could get unmarried as easily as you could turn out that light, would you press the button?" Seventeen of the women and sixteen of the men admitted that they would. Suppose, however, conditions had been arranged so that the individual could have gone into a room and dropped a black or white ball into a box, so that his or her vote could have been made in utter secrecy and in such a way that the individual casting the vote could not be checked up, the individual voting having been utterly assured of this. My own experience in this field leads me to believe that no such number as given by the authors would have voted to stay married.

Possibly the most serious question which will be raised against the research is a statistical one. Can we speak in terms of percentages when only one hundred men and one hundred women are used? It must be remembered that, if we make a hundred tosses of a penny, it may fall either heads or tails thirty-five or more times in succession and yet, if we

toss it 1,000 times, the head and tail falls will be pretty close to even. Hence when Hamilton and Macgowan use comparative terms like "more" or "less" or speak of "greater or less" percentages, one must remember that they have already asked in the beginning of the book for statistical license. This is not as serious, it seems to me, as one might think at first. When it comes to dealing with behavior problems, I for one have never felt that we should attempt to delay presenting our results to the public until a large enough number of cases can be cited to yield results statistically reliable. I would rather see the behavior of one white rat observed carefully from the moment of birth until death than to see a large volume of accurate statistical data on how 2,000 rats learned to open a puzzle box.

I do think that it is a great loss to science that this work should not be continued. The authors have made such a good start, and they have gained so much from this work, that it is hard to forgive the circumstances which make it impossible for them to go on with it for the next ten years. In my opinion the work should be extended so that many different types of people could be brought in for study. To let these authors give up this work and go about ordinary daily duties is to commit a scientific crime. Any university or educational foundation should be proud to attach its official stamp of approval to such work.

I hope that the years to come may bring a more liberal attitude on the part of our great scientific foundations. Only they, in the present state of society, can sponsor such work. If all of our so-called educational and scientific foundations were to spend all of their income on the marriage problem—or better the problem of how men and women should live together (maybe it will turn out that marriage is not the solution)—they would be helping humanity far more in my opinion than if they continued to sponsor the physical and strictly biological sciences. Science has gone far enough for a time. We as human beings should be allowed to catch up on the science of living together. Some day there will be a great twenty-five-year era, a golden era, far greater in importance to human beings than any era in natural science or any era in literature and art. This will be an era in which long and patient work by many investigators on the behavior of men and women will begin to bear fruit. It will give us a true experimental ethics. At the end of it we shall at least have as much information about how we should live together as we now have on how to plan our meals so as to get the proper vitamins, proteins, fats, and sugars.

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LIPPMANN, W. *A Preface to Morals*. New York: Macmillan, 1929. Pp. viii+348. \$2.50.

To every thinker who makes an honest, frontal attack on the ethical problem all civilized persons owe a tremendous debt; and here is one such. The results are not striking, for the problem is one of the biggest and knottiest confronting the species, and ten thousand years of puzzling has not led very far; but after a period of a hundred years or so of blankly facing a blank wall which must somehow, some time, be penetrated, it is a cause for rejoicing when even an inch of the granite has been hewn away. It is possible that Mr. Lippmann does not deserve exclusive credit for the hewing; I seem to remember a very similar central thesis back in 1916—Holt's *Freudian Wish*. But he has restated it and clarified it and approached it from a slightly different angle, and hewers are not sufficiently frequent, and the issue is too great, to warrant cheap competition for priority.

According as you happen or not to harbor and indulge an itch to observe your surroundings critically, it is or isn't a bit unfortunate that Mr. Lippman has taken the first third of his book to justify the proposal of his thesis, and the last third to prove, by applying it, that it is practical. The book club which picked it as a preliminary choice asserts that sixty thousand people preferred it to another, more conventional title. It is, of course, unlikely that there are sixty thousand intelligent people—belonging to a book club—in the country; wherefore it is probably of a great deal of importance, if the work is to have any educative value, that 142 pages are devoted to the relatively obvious thesis that authority, particularly religious authority, is quite widely challenged as furnishing an adequate basis for ethics. The phenomenon, sociologically considered, *is*, to be sure, a fairly recent one; that authority, by any variety of reasonable thinking, actually *has* nothing very important to do with ethics in its own right is one of those self-evident truths whose only mystery is that people can be bulldozed into not seeing it. The answer is of course somewhere in the not very well explored field of analytical psychology; and it is partly because Mr. Lippman, being a "layman," is not blind to what is happening in such technical fields that he has written so much better a book than the average psychologist or sociologist, who, since it constitutes his business, cannot be expected to know anything about it.

Concerning the tail-piece, which from the strictly technical standpoint also seems to wag the dog somewhat, it is perhaps sufficient to say that it is both necessary for box-office purposes, since the average reader is probably not capable of turning the crank himself and extracting the conclusions, and that it is congenial to Mr. Lippmann's style and interests, since he has always maintained a notable interest in the contemporary American scene with its politics, business, sex interests, etc. These things are all capably

and realistically treated from the humanist point of view set forth in the central section.

It is this central section which seems to me to contain the meat, however; and especially the chapter called *The Insight of Humanism*. Like the whole book, its function is not so much to evolve new concepts as to make explicit the implications of old ones. These old ones are without conspicuous exception those of the psychoanalysts and their ilk, together with the implicit ethics and psychology which the analysts themselves have too often left undeveloped; namely, the fundamental pragmatic assertion that the safest criterion of the good is the biologically harmonious, and the concept of a constant tendency toward the resolution of tensions. That which has been shown to promote maladjustment, inadequacy, pain, defeat, death, cannot be good, except temporarily. This, of course, cannot be proved; groups have arisen, and are still with us, which deny the evidence of their senses and maintain that manifest evil is ultimate good. The concept mentioned, however, perhaps best formulated in the libido theory, has a great deal of supporting evidence in its favor—ranging upward from observations no more mystical than the healing of a cut finger. These things are not stated as such by Mr. Lippman, but they are basic to his argument; the latter proceeds in terms of emotional maturity—a vastly pregnant concept. Joseph Wood Krutch, writing in the *Atlantic Monthly* a couple of years ago, opined that the race was now approaching its spiritual adolescence, a period when it could begin to dispense with the vast constructive figments by reliance on which alone in its infancy it had been able to blunder through the terrors of the Universal Dark. Freud said the same thing in *The Future of an Illusion* (it was, in fact, a necessary conclusion from his entire life's work). And this is what Mr. Lippmann has now said—that the only adequate basis for a civilized ethics is an adult emotional attitude, freed from childhood fears and fixations, clear-headed and disillusioned, intelligent, capable of making decisions on the basis of factual realities rather than on vague fears and super-ego mysticisms. The techniques are a great unexplored wilderness (the tail-piece is merely a prediction of what may be expected to happen, not how it can be made to happen); but the guiding hypothesis has now been pretty clearly stated, these four times to my knowledge. Possibly the first thing to do is to increase the number of emotionally adult individuals in the world—no small task, Heaven knows, since it involves drowning nine-tenths of all the extant parents and teachers and ninety-nine hundredths of all the parsons. Presumably one adult and enlightened generation could do more toward elaborating its own techniques than could be done by any amount of technical instruction when nobody knows the nature of the technical instruction necessary.

The social super-ego has already begun its howlings: we learn from a fair proportion of the first reviews (those in "religious" journals, of course)

that this is a dangerous book. Or a useless one, which is the same thing on a slightly higher level of insight. That is comic, to be sure; but it is also pretty grim. The deep-lying forces within man himself working against any increased measure of insight are simply overwhelming; the spectacle of the tiny spark of consciousness within a single individual, struggling to establish dominion over the vast and quaking mountains beneath, is Homeric—that of a culture trying to achieve civilization is too great to be grasped by any mind.

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GIDDINGS, F. H. *The Mighty Medicine; Superstition and Its Antidote: A New Liberal Education*. New York: Macmillan, 1929. Pp. 147. \$2.00.

A venerable figure in American higher education has evidently yielded to an impulse to clear his mind, and in the process has produced an exceedingly stimulating little book. It is not quite certain what it is about—I will make a guess presently—and a good deal of the stimulation arises from the reader's continual straining to catch sight of that which should be just ahead but never is; but it is a stimulating and useful book for all that. Professor Giddings seems to have fallen between the generations; clearly more courageous and empirical than the Old Breed which he describes, he is yet too much of it to avoid inconsistency or to perceive that there are in the world a great many estimable, though partial, answers to questions which he appears to believe are new and insoluble.

The main lines of the volume are, as indicated above, a bit fuzzy. If we may take the title as a guide, the author points out the existence of mystery—and the wish-thinking in the world, and makes certain gestures, masterful from his own point of view but a little helpless from the reader's, in the direction of what to do about it. Inasmuch as the wish-thinking certainly implies authoritarian and dogmatic thinking, these gestures themselves seem to be a part of the thing attacked; for, true to the Old-Breed tradition, Professor Giddings' idea of what to do about it is to lay down the law, and this he does in thoroughgoing fashion. It is hard to see, for instance, that *ex cathedra* pronouncements on the mechanisms by which the averments of holy men are used to bolster up wish-thinking are anything more profound than getting a man who is holier to make a counter-avertment. What a good part of his book is evidently designed to prove, but what he has neglected to perceive himself, is that a new way of conceiving these matters has crept into the world—the way, namely, of finding out *why*. A whole wide segment of relevant modern thought has here been simply omitted; there is a modest body of fact in the archives on such matters, a body considerable enough so that persons of the modern temper are in the habit (at least part of the time) of basing their speculations upon it. In view of that consider-

ation, it is a fair question whether the techniques of out-thundering one's opponent and out-charming him in the eyes of the audience by more polished oratory and cleverness are not obsolete in educated groups; and (still confining the argument to the same groups) the mere pointing out the existence of mystery-thinking is of approximately equivalent news value with a notification of the existence of street cars. Of course, I may have mistaken the audience to which the book is addressed; the educated groups I have postulated may not be in question at all—the author may have been writing a missionary tract for the use of college graduates, etc.

It would be most fruitful and interesting to follow the author into the many diverting byways into which his association chains lead him; around every corner and under every bush we should probably find material sufficient for an evening's illuminating discussion. For the present, however, let us consider in a little detail the main argument—or what seems to be such—viz., what to do about it. The title seems to indicate that the main thing to be done about it is to teach the scientific method. On looking at the text, however, we are not quite so sure; it appears (as almost everybody knows) that something believed to be this has been tried, and doesn't work; or again, it appears that Professor Giddings is not prescribing, but forecasting—i.e., that we are *going* to teach the scientific method and so find our salvation; or still again, that these are the procedures which, in some ideal world where we could do anything we liked, would remove the difficulty. We find that we may always tell a master in science, that is, an authority, by certain signs; we may believe the signs because they are attested by Professor Giddings, who opposes authoritarianism. We find also that the way to inculcate moral and civic virtues is by teaching arithmetic; the considerations that, experimentally, transfer of training over such a broad gap has been found to be virtually nil, and that so far as we know there is no great difference in the proportions of delinquent and normal populations who have been taught arithmetic, do not seem to be of any importance. Latin and mathematics have a tremendous disciplinary value; we know this because a vigorous, successful Northwestern logger, who had tried it on himself, told Professor Giddings so. But we look in vain for any mention of, say, those persons who have succeeded, under more or less describable and controllable conditions, in inducing more scientific and socialized habits of mind in children of six or seven than it is our habit to accept as satisfactory in A.B.'s of twenty-two or twenty-three. These persons are not well-known; I suspect that the reason they are not, even in the mind of Professor Giddings, is to be sought in some survival of the wish-thinking against which he inveighs. This is not to condemn Professor Giddings; it is only to urge the direction of our rational thinking upon causal sequences *even when they influence and distort our rational thinking*.

There *was* an Old Breed, and an education which marked it; it *is* still to be seen in all its beauty in the older men in whom it survives, and on the

biographical page. In fact, that beauty and its emotional grip seem to have been about all that kept its victims from achieving, along with the sanctification which has come to them, a certain vigorous and realistic greatness.

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INSTINCT, HEREDITY, AND SOCIAL TRADITION*

ROBERT BRIFFAULT

I

Like most terms imported from current speech into the language of psychological discussion, the word instinct has brought with it a persistent trail of misleading connotations. If it be restricted to the denoting of inherited behavior patterns, it has no application in human psychology. For of complex chains of action fixed in hereditary structure, similar to the instinctive activities of insects or of nesting birds, there exists in human behavior no example. Yet, instinct, which not long since was known only as the miraculous sagacity of the brutes, and to which the last classic of the old academic psychology—Ward's *Principles of Psychology*—devotes one reluctant page of generalities, disguised though it may be under new aliases recognized as the mainspring of the human psychical mechanism. "Directly or indirectly the instincts are the prime movers of all human activity; by the conative or impulsive force of some instinct . . . every train of thought, however cold and passionless it may seem, is borne along towards its end and every bodily activity is initiated and sustained" (13, p. 44).

The older psychology regarded mind as sharply defined by the subjective character of conscious experience, and as consisting of a succession of "states of consciousness." The natural starting-point of its analysis was "experience," beginning with sensations, out of which ideas and concepts, and, finally, thoughts are built up. These, together with other elements of experience, might give rise to emotions; outward behavior, as well as the course of consciousness, was determined by those clearcut elements of experience, the fiat of the will operating according to the purposes resulting from the thoughts, feelings, and emotions of the experient. Such a psychology traced the phenomena of mind from without inwards.

It is now generally realized that the point of view presented a distorted perspective. Behavior is, it is true, guided by sensations

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and experience, by the course of cogitation and the adaptive devices of reasoning; but it has become clear that these merely serve to give effect to dispositions to act which exist independently of experience. The functional purposes which the behavior of living organisms fulfill, with respect to either the biological interests of the individual or those of the race, do not originate in the processes of conscious mentation. Those processes are not the chief factors of behavior, but are themselves governed by motive powers which operate outside of the field of conscious experience and to a certain extent independently of it. Conscious mentation mediates only between those powers and the external environment represented in cognitive experience. The very character of experience, of pure sensation itself, is the result of an urge by virtue of which living things seek only that experience which may be of service in giving effect to their inherent dispositions to activity. It is not experience which has given rise to conscious life; it is, on the contrary, the forces of life which have created the forms of experience, of feeling, of sensation.

The object of psychological analysis has thus become shifted from experience to the functional dispositions which that experience subserves. Its course has been reversed. Instead of analyzing the mind from without inwards, it aims at tracing its operation from within outwards. Instead of beginning with the data of sensation, and following up mental contents until the fiat of the will, producing action, is determined by those contents, it seeks the nature of that "will," or disposition to act, by which both mental and external activity is ultimately determined, and which utilizes the fruits of cognitive experience as its guides and instruments.

It is not in consequence of the detection in human behavior of any fixed patterns of concatenated action that instinct has come to assume the paramount place which it occupies in psychological discussion. It is owing to the exact analogy between the dispositions which determine such instinctive action in animals and the ultimate springs of human behavior. The latter are not necessarily identical with the "motives" formulated in conceptual consciousness. Normal human behavior presents itself as proceeding from such consciously formulated, or formulable, "motives," and that it should be referable to such motives is the test of its being sane and rational. But those conscious motives, though they may mold the form of behavior, are not the actual powers which actuate it. Often they are plainly de-

ceptive pretexts substituted for unacknowledged or wholly unconscious intents. Invariably they are referable to some "ultimate" motive of wider scope, such as a desire to preserve life, to exalt its quality, which is itself beyond the sphere of rationalization. We strive to do what we like; that we like to do it remains for the most part the ultimate justification which our teleological analysis can furnish.

Conceptual thought itself thus bears witness to the fact that the ultimate motives of behavior lie outside its sphere. However elaborate the means by which a human being seeks to achieve his ends, his behavior is in reality the effect of innate dispositions identical in nature, function, and mode of operation with those which determine the activity of other living organisms. Animal behavior was, in the scheme of the older psychology, governed by instincts blindly unconscious of their ends; human behavior by conscious intention and foreseeing intelligence. But the foresight and intelligence extend merely to the means of giving effect to dispositions which are, to the human actor, as blindly unconscious of their functional ends as are the urges which drive the animals. Human behavior derives, in the last resort, from biological dispositions to action, whose functional purposes and utilities to the individual or to the race are not dependent upon the conscious purposes with which they are, in mental experience, associated. Those ultimate springs of human behavior do not appertain to the category of conceptually formulated purposes, but to that of organic impulses which exist independently of any process of conscious intention or conceived purpose.

It is that character of human behavior and not the existence of stereotyped action-patterns which has led to its being accounted fundamentally instinctive. Instinct was regarded by a semi-theological psychology as the substitute for intelligence bestowed upon the beasts; they were guided by instinct, man by reason. But there exists no such alternative; the human faculties have not supplanted instinct, they have become superimposed upon it. They do not afford a source of living activity other than, and different from, instinct; they afford more elaborate and efficient means of carrying out the operation of instinct.

Every reaction of a living thing, man or beast, has its ultimate source in primal needs and impulses which demand the preservation, nutrition, and perpetuation of life. These are the motive powers

without which no form of living activity can be set afoot. The most primitive organism manifests the fundamental dispositions which actuate the most highly organized. In its ultimate functional purpose the scope of man's behavior does not differ from that of the amoeba's. Those functional purposes from which all behavior, whether associated with conscious motives or not, proceeds, present two aspects to teleological analysis, according as the functions they subserve are individual or racial, refer to self-maintenance or to reproduction. In ultimate biological analysis, however, even the contrast between those two aspects of vital activity to a large extent disappears. The characteristic property of living matter, its power of restoring the biochemical structure destroyed in every reaction, is essentially an act of reproduction. The elementary forms of reproduction, by fission and by fragmentation, may, on the other hand, be viewed as self-preservative devices directed towards the maintenance of the individual life and of its efficient nutrition imperilled by overgrowth. Sexual reproduction itself, in the rudimentary form exhibited in the conjunction of protozoa, appears to have as its chief function the improvement of nutrition in exhausted, overactive individuals. The primary biological motives of "hunger" and "love" are thus confluent in their origin, and all vital activity, all behavior, would seem to derive, in the last resort, from a unitary disposition, tendency, or impulse, which constitutes the primary quality of all living matter.

In all its forms and manifestations, behavior, whether in animals or in man, consists in means and methods of giving effect to those primary dispositions. Nutritional appetite has given rise to varied forms of food-quest, assuming widely different types in the behavior of herbivorous and of carnivorous animals, and differentiated into specialized procedures in various species. Self-preservation adopts countless policies and devices, such as flight, concealment, and combativity. Sexual reproduction, itself a specialized form of the reproductive impulse, gives rise to numerous particularized instincts and modes of behavior, to the varied masculine and feminine instincts, to derivative mating, maternal instincts, and to a still further evolution of social instincts elaborated from these.

The relation between specialized modes of organic behavior thus presents, like the evolutionary differentiation of organic structure, a phylogenetic arborization, all forms of specialized behavior fixed in

heredity springing directly or indirectly from the common trunk of the primal impulses, developing into an ever increasing variety of methods and procedures by which the functional purpose is forwarded. The natural classification of instincts is, like the natural classification of morphological forms, a genealogical tree.

Every reaction of the organism, every form of behavior, is, in like manner, not a simple and isolated response to given conditions, but a complex chain or network of interacting and confluent psycho-organic factors, ranging from the end-mechanism which gives rise to the actual behavior to the primal impulse from which it ultimately derives. Each of the innumerable elements between those two extremes of the chain of causation may, in any particular instance, owe its origin mainly to inherited dispositions or to the effects of individual experience or to the modifying operation of the perceptions of the moment.

Consider, for example, a simple motor act such as that of tying one's neck-tie in the morning. The act itself is unequivocally the outcome of an acquired neuromuscular mechanism, involving fine adjustments and dependent upon a considerable amount of trained skill. But almost every instinctive disposition, as well as innumerable factors of acquired origin, may be involved in, and may affect, the actual operation. The long regression of motives giving rise to the act has its term in the hard self-preservative necessity of overcoming matitudinal inertia and getting dressed in time to keep an appointment in view of safeguarding one's bread-and-butter. The feelings aroused by the nature of the business in view, the desire to outshine some rival arousing a native pugnacity, an instinct of self-decoration and a taste for neatness in one's personal appearance, an instinct for conformity with current standards of dress, subconscious sexual motives creating a desire to impress favorably, a general state of organic depression leading to a despondent outlook, or exuberant health lending a rosy coloring to life—these and many other psycho-organic factors, innate or acquired, may enter into the carrying out of the simple act and affect the color of the neck-gear chosen, the jauntiness or sedateness with which it is adjusted, the care or indifference with which the operation is performed. The acquired action-content is, in effect, the resultant of an infinity of diverse and complex factors, which include primal impulses and into which both inherited dispositions and acquired traditions enter as ingredients.

The fixation of the factors of behavior in hereditary disposition

and structure may proceed to varying degrees. The whole behavior may be thus predetermined in detail as a series of action-patterns. Such differentiated fixation constitutes what has been regarded as typical instinctive behavior, such as the instinct-behavior of insects. It is certain that the hereditary fixity is not, even in extreme cases, absolute. Some margin of individual adaptation and variability is always possible, and such instinctive action-patterns are rather to be conceived as lines of least resistance, from which action can always be deflected by a stimulus sufficiently strong, than as a rigid automatism from which there is no escape. It is known that even in the most typical action-patterns of animals, down to simple reflexes, the neural end-mechanism is not the essential organic foundation of the instinct. The typical instinctive activities connected with reproduction, although they must be carried out by means of finely adjusted neuromuscular mechanisms, are dependent upon quite other physiological factors than the existence of those mechanisms. It is not as a mere response of that neuromuscular mechanism, acting as an isolated apparatus, that those activities take place. They depend primarily upon the operation of the reproductive glands, acting by means of biochemical products which influence the whole organism. Such specialized behavior as the care and suckling of young is brought about in castrated male animals on which ovarian tissue has been engrafted (10, p. 291.) Characteristic reflexes, such as the "clasp-reflex" in the frog, are evoked by the injection of ovarian substance; and castrated rats feminized by ovarian transplantation exhibit the "tail reflex" and the "averting reflex" characteristic of the female's behavior (10, pp. 297 ff.). In such instances, the existence of an end-mechanism enabling the reaction to be carried out must be postulated. But, since the reaction depends upon the operation of the biochemical excitant, that operation will not be abolished in the event of the end-mechanism being absent; the excitant being equally active, whether the end-mechanism exist or not, it must needs operate through some other channel of behavior.

From the standpoint of its functional value, and therefore of its survival value in reference to natural selection, the hereditary fixation of instinctive behavior presents a dilemma of correlated advantages and disadvantages. Where the conditions of life are fairly uniform, the possession of an hereditarily fixed pattern of behavior, permitting of the use of much more elaborate action

than individual initiative could improvise, is an advantage. That endowment represents, however, a corresponding loss of progressive adaptability, hence a tendency throughout the course of organic evolution to counteract the fixity of hereditary behavior and to effect a compromise between it and individual adaptation unfettered by heredity. That elasticity of behavior and the limitation of hereditary fixation are secured in animal life by two methods: by the readiness with which one hereditary tendency can be substituted for another, and by the partial elimination of hereditary influences through the retardation of individual development and its completion under the influence of educative experience.

Derivative instincts and even fixed behavior patterns may be utilized in the service of different functional purposes. Thus the fighting instinct may be used in the interests of self-preservation, in those of food-quest, or in those of the masculine sexual instincts or of the maternal instincts. The diving instinct of water-fowl serves both the purposes of food-quest and those of concealment from sources of danger, and may make their first appearance in the individual in response to either stimulus. The grubbing instinct of some insects, which is primarily connected with brood-care, may be similarly employed to circumvent an obstacle or to escape from an enemy. Such substitution may, and commonly does, take place even in the manifestations of the strongest and most fundamental instincts. It is exhibited in the reproductive instincts of organisms so typically automatic in their behavior as the social insects. The functions of the fertile and those of the sterile, or "worker," females are interchangeable. Among bees and social wasps, workers which are prevented from nursing take to laying; fertile females which are prevented from laying take up the nursing functions of workers (1, pp. 17 ff., 28 ff., 49, 56; 12, pp. clxxiv ff.; 17, pp. 86 ff.). An analogous interchange of reproductive functions takes place in the human female. The sexual impulse and all sentiments towards the male connected with it are normally inhibited in the mother during the period of lactation. Similar processes of substitution are familiar as the inhibitions and "sublimations" of the sexual impulse in man.

In the higher animals the hereditary determinism of behavior is effectually checked by the postponed development of neural structure, which takes place in the course of an ever extended period of postnatal immaturity. Infantile development under maternal care

has been the most important factor in the evolution which brought about the supremacy of the higher mammals, and must, I believe, be regarded as the proximate cause of the emergence of the human species and the human faculty. In insectivores, rodents, and carnivorous mammals a progressive increase in the period of infantile immaturity is presented, in contrast with the herbivorous animals, which are born precocious. That infantile immaturity affects chiefly the central nervous system, and it is in the maturation and structural organization of the central nervous system and of the higher centers of the cerebral cortex, in particular, that the developmental process which takes place during infancy is employed. Those conditions are greatly accentuated in the anthropoids, and most of all in man. The human infant is born with a brain which is practically functionless; its structural organization, as regards the development of the pyramidal ganglion-cells, the myelination of the sensory and commissural tracts, the growth of neuronic processes, and the development of association bundles, takes place post-natally, under the direct action of individual experience and contact with the environment, physical and social. To such an extent is this the case that no development can take place in those structures which are most closely associated with specifically human behavior, unless such experience and such environmental action operate.¹ Hence it is that no reflex end-mechanism, no fixed action-pattern, no behavior of a purely instinctive character as regards its action-contents exists, or can exist, in man.

The fixation of the psycho-organic factors of behavior in heredity, which, if complete, would deprive the organism of survival value, is thus limited by every available means, whether by the interchange and substitution of hereditary action-patterns, or by the overshadowing of hereditary influences in post-natal development of neural structure. It may be said without being unduly paradoxical that there is nothing so modifiable as instinct. In the course of progressive evolution, every applicable method has been taken advantage of to secure the maximum degree of flexibility in inherited behavior.

That flexibility and variability are greatest as regards the end-mechanism which determines the form of the action-contents; it diminishes as, in the chain of determining factors, the more fundamental dispositions and impulses are approached. The primal im-

¹For the more detailed discussion of the subject see (2, vol. I, pp. 96 ff.).

pulses of life, common to all living things, are in their motive power invariable. Derivative instincts to which they have given rise often partake of the tenacity of the impulses they subserve. The maternal instinct, for example, may manifest all the reckless and overpowering force of the reproductive instinct which it supplants. The means by which effect is given to those impulses and instincts are, on the other hand, readily prone to modification and variation. If the functional need which they subserve can be fulfilled by one form of behavior more efficiently than by another, the substitution will, wherever possible, be carried out. The readiness with which such a modification of behavior takes place is indeed proportional to the force and tenacity of the instinct from which it springs. The greater that force, the more inevitably does the impulse avail itself of any means by which its function can be exercised, the more easily does it become transformed and adapted. Behavior so specific as the herbivorous and the carnivorous types of food-quest becomes modified when necessity imposes the change and the animal is adequately equipped to carry it out. The sexual instincts in man assume cultural forms derived from the social environment, and often become scarcely recognizable under the disguise. Their malleability is the consequence of the power of their sway.

In man the operation of instincts is manifested only through the medium of indubitably acquired modes of behavior. In human behavior, the action of the most elemental functional urges of organic life usually takes the form of activities which are acquired through educative experience and social tradition. The ways in which civilized man satisfies his self-preservative instincts, provides for his sustenance in response to economic pressure, include the most varied elaborations of material and intellectual culture, from the driving of machines to the exercise of artistic and scientific abilities. The maternal instinct may operate through the medium of activities that are concerned with details of social rivalry and economic considerations, or with interest in scientific infant-feeding. The manifestations of the sexual instinct may assume the forms of art, or of religion, and almost invariably contain a large proportion of cultural and traditional elements. "The most cursory analysis of the origin of the action-patterns involved in such . . . instincts as the parental instinct, reproductive instinct, fighting instinct, instinct of self-preservation, the gregarious instinct, and the like, will show that by

far the greater part of the action-content is acquired" (1, p. 515). Even the performance of such physiological functions as eating or defecation are, in their form, governed by acquired manners and habits of convenience and hygiene. Not only are the neuromuscular activities to which instincts give rise acquired modes of behavior, but the whole implicit mental processes which go with that operation—ideas, thoughts, values, sentiments—are no less indisputably of acquired origin. The very motives of behavior, as they present themselves in consciousness, belong more often than not to the sphere of traditional heredity, and serve to disguise rather than to reveal the operation of the instinctive tendencies which lie below the level of conscious psychism. So complete is that disguise that the very existence of instincts in man was not, until quite recent years, suspected, and has come in turn to be denied. Nor is the disguise in all instances a superficial one. As will be noted later, the operation of mental contents acquired from the traditional environment exercises a very real modifying action upon the operation of inherited instincts, and creates, in fact, new derivative modes of operation of those instincts.

But that modifying action can operate only upon existing instincts. All those elaborate cultural modes of behavior, those activities carried out through the medium of the latest scientific appliances or social institutions, that conceptual mentality operating through the products of social tradition are, one and all, ultimately concerned with the satisfaction of the same organic needs, the discharge of the same biological functions, the demands of the same primal urges of living things, and the specialized instincts which govern the behavior of animals. To deny that the passionate devotion of the human mother for her children is not as instinctive as that of the animal female because not a trace of action-pattern that is not of purely acquired origin can be discerned in it, or that the behavior of the ingenuous romantic lover which does not go beyond the composition of sonnets does not originate from the sexual instinct, is not so much inadequate analysis as imbecility. While it is true that no human behavior is ever, in the form of its action, uninfluenced by acquired and socially transmitted factors, it is no less true that none, however culturally artificial and acquired in its external aspect, operates except through the motive power of those psycho-organic determinants of behavior fixed in hereditary constitution, which, in animals, have been denoted as instincts. Instinct is not a particular form or mode of behavior, but is an element and factor of all behavior.

Since no form of human behavior is either purely instinctive or purely acquired, the distinction can be applied only to the various factors into which the causation of that behavior may be analyzed. No character which has been predicated of instinctive action distinguishes it in every instance from behavior which is, in the form of its operation, acquired from social tradition. Unconsciousness of its functional end has very generally been regarded as a characteristic of instinctive behavior. But habit produces the like unconsciousness. And, although there appears to be no necessary relation between the conscious motive of behavior and the functional purpose, and the latter may commonly be wholly absent from consciousness and even quite inapprehensible to the intelligence of the acting individual, yet the conscious motive and the functional purpose may quite well coincide. Manifestations of self-preserved tendencies are, in general, represented by equivalent conscious and avowed motives; while, on the other hand, manifestations of race-regarding instincts are scarcely ever recognized by the individual under the aspect of their functional end. Even the entire absence of volition does not distinguish instinctive from acquired action; for many acts which are the direct outcome of instinctive tendencies are accompanied by lively volitional efforts, and the fruits of acquired habit are frequently as unwitting and automatic as any reflex. The psychological mechanism of behavior is, as we shall presently see, exactly the same whether that behavior be purely or mainly the manifestation of inherited instinctive factors, or whether it depends upon the operation of acquired elements of social tradition. To differentiate acquired from instinctive factors in behavior by the character of that mechanism is, consequently, not possible.

Nor is universal consent as regards an order of mental reactions a criterion of their instinctiveness, for many conspicuous elements of social tradition are universally distributed in the human race. The spontaneous, irrepressible urge of an instinctive tendency can be exactly mimicked by sentiments and attitudes which are products of social tradition and culture. And such social characters are frequently developed at so early an age—the first impression made upon the post-natally developed cerebro-psychic centers being even stronger than any impressed upon them by the iteration of habit—as to create the illusion that they are innate. The sentiment of bodily modesty, for example, is included by some eminent psychologists in their enumeration of human instincts, although that sentiment is demonstrably

traditional and owes its origin to the most artificial concepts of savage superstition. Religious emotion, patriotism, artistic appreciation, and many other sentiments manifestly of cultural origin have been claimed as innate and instinctive.

Our only means of distinguishing the hereditary from the acquired elements in the human mind lies in the historical method, in tracing the genesis of those constituents, in the study of lower cultural states, in the history of custom, of sentiments, evaluations, and prejudices in social tradition, in observing their mode of appearance in individual development, and in taking stock of their presence or absence among animals.

To those considerations a further test may be added. An instinct derived from pre-social phases of evolution always fulfills some biological function, or even if apparently unadaptive, as with some simple motor reflexes, can be perceived to be closely connected with a function useful to the race or to the individual. It is, of course, as irrelevant to take objection to the teleological conception as regards instinctive tendencies fixed in psycho-organic heredity as it would be with regard to purely physiological functions. Whether such instincts have been mainly developed through the operation of natural selection, as is probable, or whether they have arisen in some other way through the functional activities of living organisms, their development and survival are due, like that of all vital organization, to the utility of the function which they fulfill, either as regards the individual life or the race. That function is the *raison d'être*, and therefore the natural description of the instinctive factor in behavior. Hence an instinct can scarcely be said to be fully defined so long as it is not reduced to terms of an adaptive purpose subserving the interests of the individual or racial life. An "instinct of self-abasement," or of "self-assertion," for example, appears to require, in order to be apprehensible and classifiable as a biological disposition, to be definitely connected with some biological purpose.

The functional purpose which determines behavior, and not the actual form which that behavior assumes, is the essential element of the instinctive factors fixed in heredity which govern behavior. While that behavior may be highly specialized, and manifest itself in activities predetermined in the minutest detail, it may likewise be wholly unparticularized as regards the means employed to forward its biological function. The latter is quite as much instinctive behavior as the former. The behavior of the young widow who labors

at producing modern fiction or artificial flowers in order to provide for the education of her children is no less the outcome of instinctive impulse than is that of the *Ammophila* wasp which provides for the support of her brood by paralyzing caterpillars.

It has been urged that such concepts as "tendencies" and "dispositions" are too vague for scientific purposes. But to set aside the unparticularized character of the forces which give rise to particularized behavior would be to miss the nature of the mechanism which governs behavior, and would not be in accordance with scientific truth. The operation of the psycho-organic factors of behavior proceeds from general functional purposes to particularized activities subserving those general biological dispositions in the same manner as organic development proceeds from undifferentiated embryonic cells to differentiated and specialized organic tissues. Behavior, it would appear, is never *superficial*; that is, it is never, except, perhaps, in the instance of a few pure reflexes, the product of a separate apparatus of immediate response. The whole hierarchy of psycho-organic factors represented in the organism as a whole is involved in every act. In the same manner as many differentiated tissues and organs subserve the same or similar functions, varied modes of behavior are, in advanced stages of evolution, at the disposal of a common vital function. The detailed action-patterns of articulates, the elaborate forms of pre-determined behavior—to which popular language more particularly attaches the term instinctive—are in reality the simplest, the most rudimentary and undeveloped forms of organic response. The insect is restricted in the manifestation of its instinctive tendencies to one narrow groove; the elaboration of its hereditary action-patterns proceeds from the lack of alternative provisions, from poverty as regards the organic means at the service of its instincts. The wider range of means of which the higher mammal may make use is an elaboration of those instruments and corresponds to a wider differentiation of organic structure. The forms which organic function assumes become themselves more varied, differentiated, and specialized as we rise in the scale of organic evolution. The reproductive impulse, which in lower forms is confined in its function to the laying of fertilized ova in reckless profusion, is, in higher forms, differentiated into various derivative procedures for the protection of the brood, into maternal instincts, mating instincts, nesting instincts, migratory instincts, and many

other specialized dispositions which are derived as adaptive modifications from the reproductive instinct.

It is that more complex and varied differentiation of instinctive functional tendencies which gives rise to the unpredictability of the higher forms of behavior as contrasted with the relative determinism of the response of lower organisms. The unpredictability of human behavior is, in a large measure, due to the interplay of a multitude of instinctive tendencies, each of which may enter in varying proportions into the causation of behavior, according to the action of labile conditions almost infinitely permutable. The "freedom of the will" is, in one aspect at least, the effect of minimal determinants in a large number of permutations and combinations of leading to a result opposite to that manifested in physical laws, whose rigid determinism is the outcome of the constant average produced by an infinite number of variables. It has been said, on the one hand, that instinct plays an insignificant part in human behavior (18), and, on the other, that man possesses more instincts than any other animal (9, vol. 2, pp. 393, 441). Both statements are, in a sense, true. The determination of actual behavior is least in man. But that very indeterminateness is the result, in part at least,² of the multiplicity and variety of the instinctive tendencies.

The confusion which gives rise to those contradictory views, and to most controversy concerning instinct, arises from a desire to define instinctive action as a particular mode or type of psycho-organic mechanism, by assigning to it some character, such as pre-determination of the mechanism of action or the absence of foresight as regards its functional end. But, if by instinct we understand the inherited, as opposed to the acquired determinants of behavior, those superadded specifications of its mode of operation, drawn from the old conceptions of instinct as a peculiar faculty of animals, are not applicable. For, in order to be valid for purposes of definition, those additional descriptions of the mode of operation of instinct must be shown to be always present in inherited factors of behavior, and always absent in non-inherited factors. And it is at least doubtful whether such a demonstration is possible in the present state of our knowledge. The conception of instinct, as now used, has reference to the inherited factors of behavior and not to any specific feature

²The qualification has in view the further variety introduced by the operation of conceptual values, to which reference will be made presently.

in their mode of operation. Concerning that denotation of the term, all are agreed. No other definition or conception which cannot definitely be shown to correspond with it in its extension is therefore valid.

II

Since the defining character of the instinctive factors of behavior is that they are transmitted by way of physiological heredity, the paramount problem of instinct stands in close relation to the paramount problem of modern biology, the problem of heredity. The transfer of the foundations of behavior from the contents of conceptual consciousness to inherited psycho-organic dispositions, which marks the tendencies of modern psychology, lends a new meaning to the old problem of the relation between the mental and the organic aspect, between the subjective field of consciousness and the objective field of organic structure and function. The two aspects, which, in any philosophical view, are dependent upon the forms and modes of our knowledge, are not only more than ever inseparable, but the nexus between them is seen to extend considerably farther than a mere parallelism in which the elements of the two aspects correspond, each to each. The phenomena in the organic chain of causation related to conscious activity cover a much wider range than the physiological phenomena which constitute the immediate organic obverse of that activity. In other words, the complex of factors which has to be taken into account is much more extensive on the organic than on the subjective side, and bears, on the former aspect, a proportional relation to the subjective phenomena of consciousness similar to that which the entire spectrum of ether-vibrations bears to the portion visible as light.

Dr. Bernard, in his able work on "*Instinct*," in which he has considered in detail the question as to the form in which dispositions laid down in organic structure and handed down by physiological heredity are transmitted, conducts his discussion of the problem in the light of the fundamental axiom which is apt to be regarded as the most concrete statement of the necessary correlation between mental and physiological phenomena, namely, that "to every psychosis there corresponds a neurosis." But the dictum, pertinent as it was in criticisms of mystic dualistic conceptions, is by no means impeccable in its formulation. To every psychosis there corresponds a good deal more than a neurosis. The nervous system,

even more than any other organ, can by a methodical fiction only be isolated from the organism as a whole. Its operations are but a portion of the organic correlates of any given psychic event. Properly speaking, the simplest reflex "arc," the theoretical paradigm of nervous reaction, is in a schematic sense only conceived as abstracted and isolated from the organism of which it forms a part, and independently of which it could neither come into existence nor function.

The nervous system is only one—the most perfected and convenient—of the several channels of intercommunication between the various parts of the organism by means of which the disposition of any one part may influence the functions and reactions of all others. Simple protoplasmic continuity is another such channel or correlation. All the component cells of a living organism, including those of the developing embryo, are connected with their neighbors by numerous bridges of living protoplasm. That continuity establishes, we know, a synthesis and synchronization of reactions between the cells, which causes them to react identically to a given stimulus, the effect of the stimulus being transmitted from cell to cell along the finest protoplasmic connection (20). Thus a vegetable cell connected with another by a long and fine filament will exhibit the same chemical reactions in relation to the building of a cell-wall as the cell with which it is connected. The component cells of a *Volvox* colony wave their flagella in perfect unison, the motor stimulus being transmitted from cell to cell. In the Siphonophora, which are regarded by many biologists as colonies of disparate individuals united by a common stalk of living substance rather than as individual organisms, the movements and reactions of every part are finely correlated, as in the act of swimming or diving, although there exists no integrating nervous system. That coordination, which is not the outcome of the action of any coordinating center, but of the balance and equilibrium established between the conative dispositions of conjoined elements, each of which is influenced by all others, is quite as effective as that which takes place through the nervous system in more highly differentiated organisms.

A nervous system is merely an adaptation and elaboration of protoplasmic continuity, which permits of more rapid or more finely adjusted correlation of molar movements in relation to more elaborately differentiated afferent impulses. To assume that all psychosis must, in the nature of things, have as its correlative a neurosis,

that is, an operation of the nervous system, is a survival of conceptions which pictured the "mind" as located in the brain, and is much as if it were assumed that no locomotion is possible in the absence of railways and automobiles. The central nervous system in man fulfills the functions of a central telephone exchange in which elaborated afferent stimuli are brought into connection with the dispositions and impulses emanating from every part of the organism. But apart from the organism as a whole, such a system is as devoid of function as a telephone exchange without subscribers or operators. However much the afferent stimuli may be elaborated by the operation of the cerebrum, and may accordingly modify the effects of organismal impulses, it is not from the brain that those impulses which bring about behavior ultimately emanate, but from the organism as a whole.

There is, besides neural and protoplasmic transmission, a third channel through which the various parts of the organism act upon one another. All the cellular elements bathe in the fluids from which they draw their nourishment. The blood serum not only supplies the material necessary for functional metabolism, and makes good the catabolic losses resulting from every cellular reaction; it also carries away the biochemical products of those reactions and distributes them throughout the organism. Since every given reaction represents a particular catabolic process, the resulting products discharged into the serum vary in a manner corresponding with the reactions of the tissues from which they emanate. We are now familiar with the fact that the internal secretions thrown into the blood-stream by certain tissues, such as the reproductive glands, the suprarenal, thyroid, pituitary, pancreas, and other glands, affect in a potent and fundamental manner the whole organism and the character of its reactions and behavior. That those effects of the hormones of the so-called endocrine glands are but a particular instance of the similar influence exercised by every living tissue through the distribution by the blood-stream of the products of its reactions would seem to be a natural conclusion. That conclusion presented itself to the first investigator who apprehended the action of hormonal biochemical products. "All the tissues," said Brown-Séquard (4), "are, in our view, modifiers of the blood by means of an internal secretion taken from them by the venous blood We admit that each tissue, and, more generally, each cell of the organism, secretes on its own account certain products or special

ferments, which, through this medium, influence all other cells of the body, a definite solidarity being thus established among all the cells through a mechanism other than the nervous system. . . . All the tissues, glands and other organs, have thus a special internal secretion, and so give to the blood something more than the waste products of metabolism" (p. 43).

There is no more definite and conspicuous instance of the operation of instinct in man than that presented by the manifestations of sex. We know that, in that instance, the organic basis of those manifestations is not any specific neural structure, but the biochemical action of the interstitial cells of the sex-glands. These do not operate through the medium of a specific structural mechanism, any more than the sexual instinct manifests itself through a fixed action-pattern. Every function of the organism is affected by the sex-hormones in the same manner as every structure of the organism, every tissue, every cell, is modified in accordance with the somatic characters of sexual dimorphism. The general character of the effect derived from the physical source of the manifestations, and affecting each part and each function, corresponds in this instance to the general disposition or tendency which, in the operation of the instinct, manifests itself through infinitely varied modes of behavior.

The organic correlates of instinct, if by instinct we understand inherited factors of behavior, cannot therefore be assumed to consist necessarily of neural structures giving rise to a predetermined reflex mechanism. Those correlates include biochemical dispositions which are not represented by anatomical or histological structure. The structural and functional characters of the neural apparatus which gives effect to the manifestations of instinctive behavior are themselves products of that biochemical action. For not only is functional behavior controlled by it, but also the formation of organized structure. Sexual characters, both physical and psychic, are not developed out of any structural germs of them, but as the result of the biochemical activity of the gonads, and they can be produced or abolished according as the products of that activity are supplied or withheld. The neural structure upon which the motor manifestations of behavior depend is not the inherited basis of that behavior, but is itself an end-product of that bio-chemical basis.

The mechanism by which the hereditary factors which govern

behavior are transmitted in those instances consists of homogeneous chemical characters which are distributed throughout the organism, and cannot therefore be thought of as reproducing "unit characters" in a topographical and structural sense. The sexual hormones are, it is true, specific products of the sex-glands; and the organic foundation of the manifestations to which they give rise may thus be regarded as localized in the cells of those particular glands. But the facts of endocrinology point to the conclusion that, for those manifestations to take place, the biochemical activity of other organs, such as the supra-renals, thyroid, and pituitary, is also necessary. The effects of the gonadic hormones would, further, seem to be dependant upon the biochemical constitution of the various tissues and organs upon which they act, and may be regarded as releasing in those tissues and organs sexual activities inhibited by the specialized functional differentiation of those organic structures. For, in fact, all differentiated tissues are developed from cells originally identical with the embryonic cells of the gonads, and that identity is lost only as specific functional differentiation proceeds in the course of the mechanism of ontogenic development.

In discussing that mechanism in relation to the inherited factors of behavior, Bernard is led to deplore the unfamiliarity shown by psychologists with current biological theories. In those theories, which were first put forward by August Weismann, and which, with certain modifications which do not affect their fundamental principles, are still predominant among biologists, the inherited characters of the organism are conceived as separate, and more or less independent, "unit characters," which owe their origin in ontogenic development to corresponding structural elements—"determinants," or "genes"—located according to a determinate order in the nuclear chromosomes of the gonadic cells. "All the nerve-cells of the brain," says Weismann (19), for instance, "possess their special determinants, as otherwise the transmission of such fine shades of mental qualities in man, would be inexplicable" (p. 57). The biologist draws his conclusion in this instance by reference to the data of psychology. The psychologist is in like manner bound to take into consideration the data and results of biological and physiological science. But the theories of heredity above referred to cannot be included in those data or results; for they are eminently speculative hypotheses which are strongly repudiated by many competent biologists, and which appear to be, in many instances, no

less difficult to reconcile with the facts and results of biological science than with those of psychology. They are irreconcilable—except by means of quite independent subsidiary hypotheses which run counter to the principles of the main supposition—with the facts of regeneration, of the development of complete organisms from fragments, often infinitesimal, of the ova, or with the reversal of their polarity.

Of Weismann's elaborate description of the "architecture of the germ-plasm," it was long ago remarked by Romanes (16) that "our guide is able to show us such strange and interesting phenomena that we return to the fields of science with a sense of having been indeed in some other world" (p. 118). The remark remains appropriate after more than thirty years of research under the inspiration of that guide. Its purport is repeated by Dr. Julian Huxley (7), who professes to be an ardent partisan of the more recent modifications of those theories. The speculations of Weismann are, he says, "marked by a total failure to construct a physiological theory of development, a failure which led him into an unreal symbolism" (p. 247). But in spite of Huxley's assurance that the subsidiary speculations by which Weismann endeavored to remedy the incongruities of his theories are today "only of historical interest" (8, p. 300), that failure depends upon a character which is common to Weismannism in its original form and to all its revised versions, namely, that they are theories of preformation. The conception that the entire structure of the differentiated organism is "represented," part for part, in the gonad-cells by a parallel differentiated structure of "determinants" or "genes," corresponding to the differentiated organs and tissues, each to each, is a theory of preformation. Such a theory explains nothing, for the development of a complex organ or differentiated tissue from a "determinant," or "gene," merely repeats the problem presented by the development of the organism from a single cell. It shifts, but does not solve it. And a theory which represents the process of reproduction as being the result of a highly specialized and complex mechanism peculiar to the reproductive cells, and pictures those cells as the most complex and highly differentiated in the organism, is opposed, in principle and in detail, to every conception of organic function to which our knowledge appears to point.

The reproductive power of cellular elements is inversely proportional to the degree of their specialization and structural differentiation.³ Reproduction, the most fundamental function of living

³Cf., *e.g.*, (13, p. 161) and *passim*.

matter, which is implicit in every metabolic process, cannot be regarded as the special attribute of particular organs and tissues, produced by an elaborate evolution in structural differentiation. The function is common to all living tissues, which possess in varying degrees some measure of reproductive capacity, in the same manner as every living cell, whether differentiated as nerve-tissue, digestive glands, muscle-fibers, etc., breathes, assimilates, and is sensitive to stimulation; each manifests besides its specialized function, all the fundamental functions common to living tissues. The reproductive capacity is limited only in extent by the degree of functional specialization and differentiation of a given tissue in other directions, and the gonad cells are, accordingly, of all the cellular elements in the organism, those which apparently undergo the least amount of differentiation, the "germ-plasm" thus remaining "segregated" from the first throughout the process of embryonic development. Upon that absence of specialized differentiation, and not upon any specialized complex mechanism and structure, the power characteristic of the gonads would appear to depend. The structure of the chromosomes in the germ-cells, and the phenomena of mitotic division, which have been regarded as the visible aspects of the supposed special mechanism of the germ-cells, are not peculiar to those cells; they are common to every living cell, and to every cell in the composite organism.

The facts which, in Weismann's speculations, have called for subsidiary hypotheses and subsidiary distributions of "germ-plasm" require similar explanatory devices in any modification of those preformationist theories, so that the postulated special mechanism has to be repeated in countless replicas ever more extended in their distribution. "It should not surprise us in the least," says Huxley (7), "to find the identical gene-mechanism in every cell of the body. The mechanism of a dozen Broadwood pianos may be identical, but the melodies elicited from them may and will differ with the executant. The executant is for us represented by the environment, whether intra-cellular, intra-organismal, or external; the construction of the pianoforte by the gene-complex, and the different types or melodies by the various types of differentiated cells in the adult body; of the genes in any one cell, some will remain dumb, some never sounded; in one cell a gene will be working at full activity, in another partially inhibited, in a third neutralized by the products of others. Each environment will strike a different combination

of genes . . . Each cell represents a particular state of equilibrium, and the organism as a whole an equilibrium of all the cells with each other and with the environment . . . The development of an organism is a series of states of equilibrium, usually increasing in complexity, none fully balanced, but each resolving itself automatically into the next" (pp. 246 ff.).

The conception outlined by Huxley abolishes the incoherencies and incongruities of the theory of mosaic preformation, but it abolishes, at the same time, the essential principles of that theory and the explanatory function which it was intended to perform. If the structure of the ovum does not differ from that of any other cell in the organism, except by the absence of any of the specialized differentiations corresponding to the functions of the latter, we can no longer be called upon to view the ovum as "not a simple undifferentiated cell, but highly specialized" (p. 238). And if the local differentiation which accompanies the specialization of function in somatic cells be the result, as Huxley so clearly expresses it, of the action of the environment, intra-cellular, intra-organismal, or external, acting upon identical structures and dispositions, and not of special determinant structures peculiar to the ovum and containing the preformed plan of the organism, the latter preformed plan and the whole architecture of "genes," postulated to bring about what is now said to be produced by the relation to the environment, becomes a gratuitous and superfluous hypothesis.

The complex mechanism of distinct members or elements, compared by Huxley to the notes of a Broadwood piano, is not necessary to bring about varied reactions in response to varied intra-organismal environmental stimuli. Every chemical substance, even the simplest, gives rise to a variety of reactions in relation to a variety of reagents. It has not occurred to anyone to postulate a complex structure of separate determinants in the molecules of sodium or of selenium in order to account for the behavior of those substances with reference to acids, alkalis, water, light, or electricity, respectively. The reactions are assumed to be in each instance the outcome of one and the same constitution in response to various situations and stimuli. The behavior of living protoplasm, which, in any particular relation, intra-organismal or external, reproduces the ancestral reaction, at the corresponding stage of differentiation, to a similar intra-organismal or external relation, no more calls for the assumption of separate determinants for each reaction than does the behavior of selenium to light or of sodium to water.

The distinction drawn in the forms of our thought between those reactions of embryonic cells which give rise to structural differentiation and growth, and those which are manifested by mature cells in physiological function and, in the aggregate, as psycho-organic behavior, is an artificial abstraction. Structure and function, form and behavior, are analytical aspects of the same activity. The morphogenetic activity which results in differentiation of structure during the course of ontogenic development, and the kinematogenetic activity which results in functional response and behavior are manifestations of the same biochemical configuration of energy. To imagine a separate and different mechanism for each is an arbitrary and unwarrantable assumption. Developmental differentiation and growth do not terminate at birth; every exercise of function involves structural change. The reactions which bring about the structural organization of the cerebral cortex are the same as those which give rise to its functional activity manifested in behavior. The former cannot take place in the absence of the latter any more than the latter can take place in the absence of the former. The biochemical substances which give rise to somatic sexual characters in every tissue of the body are the same as those which produce sexual behavior also. Every form of behavior might, with as much verisimilitude, be imagined as represented by an architecture of determinants in the protoplasm of the active organism as each morphogenetic reaction. Those reactions of undifferentiated or imperfectly differentiated cells which result in structural organization are, like their functional behavior, the effect of their internal relation to the rest of the organism; morphological characters can no more be developed as isolated units than any part of the organism can function as such. The expression "unit character" is in a physiological sense devoid of meaning.

All living protoplasm manifests dispositions to react in a given manner, and the protoplasm of every individual organism differs in some respects from that of every other as regards the character of those reactions. Those individual variations are of the same nature as the primary qualities which are the basis of organic activity in all living substance, and are modifications of them, not superadded qualities. The enormous differences which are manifested in the behavior of a complex organism, such as a mammal, and that of a simple protozoan are the result of differentiations of function and internal relations among the innumerable cells of the organism. But that differentiation in the cellular elements is brought about by the gradual

modification of embryonic cells. It results from permutations in the qualities and dispositions present from the first in those equivalent cells and in the parental ovum. No new quality is superadded in the process. And, although the behavior of the mammal, of the human being, may seem incomparable with that of the amoeba, yet the functional dispositions of which they are the outcome are, in the last resort, identical with those manifested by the protozoan. The nerve-cell, the brain-cell, are modified embryonic cells; they have acquired no fundamentally new property, although the combination of millions of cellular elements, each differentiated in accordance with its total relation to all others, results in the psycho-organic differences between the activities of the man and those of the unicellular organism. Similarly, the ovum from which that process of differentiation starts does not possess fundamental dispositions or properties differing from those of the protozoan which it resembles in structure; those reactional properties are modified, so that it reproduces ancestral reactions in response to given relational stimuli; but they are not added to. The primary qualities of protoplasm are believed to be due to its biochemical constitution; there is no ground for supposing that the modifications of those qualities are due, not to biochemical constitution, but to an organized assemblage of histological structures.

No fact is known which either proves, or compels us to assume, the existence of unit characters represented in the ovum by localized determinants. The behavior of Mendelian characters is no other than we should be led to expect on any view of the mechanism of their hereditary reproduction, and is equally well accountable on the theory of homogeneous biochemical dispositions as on that of an architectural mosaic. If a man should inherit from one of his parents a disposition to run away under the influence of fear, and from the other parent a disposition to stand stock-still in like circumstances, it is highly improbable, on any theory, that the two dispositions would blend into a tendency to run backwards and forwards. Seldom, if ever, can a biological reaction, whether morphogenetic or kinaematogenetic, blend with its opposite and retain functional value. Such blending would, in most instances, constitute not a compromise between the two hereditary reactions, but a third and totally different reaction devoid of the functional purpose of either.

The proportions in which parental characters appear in the offspring, in typical Mendelian inheritance which has not, by the way,

been yet observed in man—is a statistical average deducible from the laws of average and the respective stability or hereditary force of the dominant and recessive dispositions. That proportional distribution affords no sort of inductive evidence for a topography of separate determinants. Nor do the sexual variations in the number of chromosomes, or any results of experiment, prove a qualitative and topographical rather than a quantitative and biochemical difference in the structure of the germ-cells.

In view of such considerations, there appears to be, in the present state of our knowledge, no obligation on the part of the psychologist to press his conceptions and conclusions into the mold of the hypotheses of Weismann or of Mendel. Many reflex reactions could, no doubt, be viewed as “unit characters,” and as being transmitted as more or less independent neuromuscular mechanisms. But the general conception which emerges from a consideration of the hereditary factors of behavior, in the higher forms at least, is that of more or less generalized tendencies making towards a functional aim by whatever channel is available, and pressing various forms of behavior, and therefore diverse neural mechanisms and organs, into the service of that functional end. With that conception what is known of the mechanism of hereditary transmission and of development entirely accords. The determination of function and of structure is known to be in many instances dependent not upon structure in the histological sense, but upon biochemical disposition; and there appears to be no sufficient reason to think that this does not hold good in all instances.

III

If behavior which is deliberately, consciously, and purposively carried out, as normal human behavior usually is, may yet be, in its primal motive source, the manifestation of instincts related to quite other functional purposes than those which appear to the conscious agent as the motives of that behavior, how are those instincts represented in the contents of consciousness? In other words, in what manner does the kinematogenetic disposition of an instinct so operate upon conscious mentation as to make the latter subservient to the functional purpose served by that instinct?

The answer given to that question by McDougall is that the instinctive factor of behavior is represented in consciousness by emotion. The chief fault of that explanation—a fault for which not

McDougall, but the state of our psychological knowledge is responsible—is that it interprets a concept which is as yet misconceived and disputed by means of another which is no less undefined and controversial.

Like the term "instinct," the term "emotion" bears, in popular language, connotations which cannot be maintained in an accurate use of the word in psychology. It cannot, as in the popular connotation, be restricted to affective states raised to a superlative degree of intensity, but denotes the affective tone which is part of every experience and of every perception, of every "state of consciousness." There are no unemotional states of consciousness. "The experience which is utterly drab, trivial, blank and meaningless, is by that very insipidity framed in its particular feeling-tone" (3, p. 57). Emotion, in the sense of that affective tone which is a necessary part of all consciousness, is the very basis of consciousness; for it can be shown that the most purely cognitive processes of feeling, down to sensory perceptions, are clearly derivatives of pure uncognitive feeling, which represents the relation of the environment, in the broadest sense, to the tendencies, directions, and aims of vital activity. "An affection, a feeling, an emotion, is, then, the experiential obverse of those conative dispositions, their mould, their form and pressure in consciousness, when they are checked or intensified; it is the stimulation or obstruction of a conative tendency. That affective value is the only value, is the only form in which a conative tendency or disposition is represented in consciousness. We do not know any conative tendency directly as such; that lies outside the sphere of consciousness. We only know its imprint in feeling, in the experience of pleasure or pain, in the variety of affective states" (pp. 62 ff.).

The emotional element of consciousness arises and operates in two different manners, which it is useful to distinguish. It may arise, so far as regards external experience, spontaneously, without being apparently evoked by an external stimulus; the emotional state is thus of internal origin, endogenous. The behavior of animals at the rutting season, and the emotional state which may be assumed to accompany it, for example, have no necessary reference to any external stimulus, to an external object of perception; the male experiences the effects of rut at a given time, quite apart from the presence or absence of any external objects of sexual stimulation. A man may be elated or depressed and despondent in consequence of the general tone of his vital functions, and quite apart from any external cause

to which his emotional condition may be assigned. His state of optimistic elation or of despondent depression will color his experience and impart its tone to the external world, instead of being evoked by their contents. On the other hand, the most prominent feature in the production of an emotional state may be the value which a certain perceptual experience, a certain object, bears in relation to the experient's disposition and interests at the time. The emotional state is evoked by environmental causes, is exogenous; as the fear produced by a fearful object, the stimulation resulting from the perception of an "interesting" object, and so forth. In either case, whether the emotional state be endogenous or exogenous, the emotional value imparted to the external experience or object is dependent upon the relation of that perception to the conative dispositions of the experient.

Every emotional state has thus two slightly different aspects, or elements: the subjective feeling itself, and the affective value which every object of perception bears.⁴ The subjective aspect, consisting of the organic feelings and coenaesthesia, which in the James-Lange analysis constitute the whole of the emotion, is but one element of it, to which corresponds as a correlate an objective aspect, which invests objects of perception, actual or ideal, with corresponding values. Objective values and subjective feelings are the indissociable terms of the emotional reaction. That reaction appears in most instances, to introspective consciousness, to be called forth by the object acting as a stimulus and bearing a given value; fear by the dreaded object, erotic emotion by the sexual object, desire by the desirable object. But, in reality, those values are as much the product of the feeling, or rather of psychic action as a whole, as the feeling is the outcome of the stimulus. All values are relative; they are relative, that is, to the attitude or disposition of the evaluating organism. The generally menacing object will not cause fear if the particular attitude of the experient renders him indifferent to the kind of danger threatened; the erotogenous object will not give rise to erotic excitement if it be regarded with the frigidity of the scientific attitude;

⁴The failure to draw the distinction appears to me to be the chief fault in McDougall's treatment of emotion as the stimulus or manifestation of instinct. He appears to consider the objective aspect only—the "value," or meaning—while, on the other hand, in the James-Lange theory the subjective aspect alone is taken into account, the external stimulus being apparently ignored.

the desired object is only such in view of the particular appetite of the subject.

An emotion in its purely subjective aspect, the aspect which the term is most commonly understood to connote, cannot *per se* give rise to behavior, at least to such behavior as is directed towards an external object or purpose. But all behavior, whether of inherited or of acquired origin, whether instinctive or not, is determined by the values which are assigned to the object, actual or ideal, to which it refers. We are concerned with environments, situations, "objects," in so far only as they possess values for us in relation to our aims, desires, dispositions; and all behavior is the response of the organism to those values. The cognitive function of central consciousness, with its apparatus of concepts and thoughts, is an estimation of values. The very foundations of cognition, the senses, reveal nothing in the external world but values, the relation of the object to the functions, uses, and operations of our activity. The material world is known to us only in terms of our possible movements and energies, as extended and resistant, as spacial, as massive and prehensible, as matter and motion. The whole "problem of knowledge," the whole of epistemology, and also of ontology, rests upon the confusion that anything else is revealed to us by sensory intuition, that the "nature" of objects is intuited. The sole biological function, in relation to which means of knowledge have developed, is that of estimating values in relation to our dispositions to action and as guides to behavior. That cognitive evolution has originated, there can be little doubt, from values of a purely affective character, painful or pleasant, out of which the cognitive character of exploratory feeling has gradually developed. All the values which determine behavior are hence of necessity affective. Cognitive perception is an elaboration serving to give wider range, discrimination, and foresight to affective values corresponding to the experient's conative dispositions. "Meaning" is thus primarily affective, and only in a subsidiary and derivative relation, cognitive.

The central consciousness associated with the central nervous system mediates between the organism as a whole and the environment. It is the means by which the organism, as a whole, with its kinematogenic dispositions, is informed of its relation to external conditions. But central consciousness, which comoves the whole organism down to the last living cell, by the report of the situation which it supplies, does not, obviously, convey the information in the

form of conceptual perception. The gastric glands are stimulated by the prospect of appetizing food, the functions of the kidneys are affected by the perception of danger; but the gastric glands do not apprehend the French menu any more than the renal glands intuit the falling of a bomb. A man may be driven into a frantic rage that will positively prostrate his organism by the account which he reads in his morning paper of the political situation. His somatic tissues have, of course, no appreciation of the political situation. The conceptual perception is, in transmission, transformed and degraded into much simpler and more primitive biological stimuli. The message which is flashed from the brain as an indicator of values to the viscera, to every cell in the body, and sets up a repercussion in each, is not couched in the language of conceptual perception, but in the more primitive language of organic consciousness, out of which conceptual perception itself has, at one time, been elaborated—the language of affective values.

In being called forth as a reaction to affective values, instinctive behavior does not differ from any other mode of behavior; affective values, from the crude promise of pleasure or threat of pain, to the most abstract and artificial standards of social tradition, are the sole stimuli which can give rise to external behavior. The distinction between the instinctive and the acquired elements of behavior ultimately resolves itself into the question of how far the values assigned by percipient consciousness to the objects bearing upon the situation have been determined by hereditary dispositions, or have been modified by individual experience and social tradition.

Normal human behavior, explicit in external act or implicit in mental act, is, to an overwhelming extent, shaped by the acquired factors of individual education and social tradition. The values which habitually determine the behavior of social man are, in a preponderating degree, values derived from the educative operation of the social environment. We do what is, according to those values, deemed befitting, wise, advantageous, right, just, of good report. The human being who habitually departs from those traditional acquired values is insane.

How, then, the question arises, is that substitution of traditional for innate and inherited standards brought about? If every activity ultimately derives its motive power from an instinct, how can instinct be superseded at all, how can it become so obliterated as scarcely ever to come to the surface, in human behavior, in its bare form?

The answer rests precisely upon the fact that the sole stimulus of external origin which can bring the instinctive springs of behavior into operation acts in the form of values. It follows that if the value of any object or situation be modified by educative experience, by social tradition, the instinctive reaction must needs conform to that modified value and not to the instinctive or natural value of the object. Most reactions to situations of danger, for example, are characteristically of an instinctive type; but the instinctive manifestations of fear produced by the sight, say, of a bare electric cable known to be "alive," or by apprehension of the disapproval of associates, are called forth by values which are clearly dependent upon educative experience. The operation of instincts is determined by the emotional values assigned to the object or situation by the perceptive faculties, and is dependent upon that evaluation. Be that value ever so artificial and conventional, the instinctive disposition has no option but to operate in accordance with it. The value assigned to money is purely traditional and conventional. But that eminently artificial value sets in operation the most fundamental and primal forces of biological instinct. Erotogenous stimuli are, in the profoundly artificial conditions of civilized life, largely of social, cultural origin; but their effect upon behavior belongs to the deepest strata of biological activity. Thus it is that, while all behavior is, in its ultimate source, instinctive, it is, at the same time, determined in its form by social factors. Acquired tradition cannot supply the motive which causes behavior; it cannot create kinemato-genic dispositions, it cannot even, strictly speaking, modify, check, or obliterate instincts. It is not instinct which is modified by social education, but the values upon which the operation of instinct depends.

The psychic forces by which the effective operation of instincts is modified and repressed, and the artificial values of social tradition substituted for biological values, are themselves derived from instinctive dispositions. The control of instinct can take place only by pitting one instinct against another. The instinct which makes conformity with the social environment the path of least resistance in behavior, the dread of incurring social disapproval, the overmastering tendency to conform, to adopt the mentality and the values of the social group, the instinct of imitation, the primitive credulity which tends to accept unquestioningly whatever is asserted, to accept without criticism the estimates of traditional mental currencies, these are

innate dispositions which render that orthodox behavior more spontaneous and more easy than revolt, eccentricity, originality, defiance, unorthodoxy, criticism, and skepticism. It requires courage to be original or immoral. Given a social environment with a formulated tradition of principles and accepted values—a situation which is realized only in human conditions—the path of least resistance is that of unquestioning conformity. Behavior invariably tends to adopt the easiest path; primitive inertia, requiring the stimulus of some potent urge to rouse the organism to action, is one of the most elementary of instinctive dispositions.

It is, I think, unnecessary to postulate a special and generalized instinct of gregariousness. Far too much has, in my opinion, been set down to that facile formula. The primary tendency of life in this respect is to disperse as far away as possible from competition, and the phenomena of so-called gregariousness in animals are accountable by special causes. The social instincts manifested in man and the group-mind phenomena are connected not so much with any general tendency towards gregariousness, which, as regards strangers, is conspicuously absent in uncultured humanity, as with the particular causes which link the human group into a solidary social unit, and have been the proximate cause of that social grouping. The prolonged state of infantile dependence of the human individual is the chief factor. Man grows up as a dependent being. It is one of the most clearly recognized psychological laws that the first habituations and the first impressions fix the type on mentality and behavior. The human individual is born completely dependent upon parental and social care; he matures under those conditions of social dependence. To look to others for protection, assistance, and guidance, to accept their authority, to require their approval and sympathy, are the characters of human mentality which follow necessarily from the dependent conditions of human growth. Thus it is that the social instincts, in all those manifestations of them which condition the substitution of social human values for biologically functional instinctive values, and thus bring about the apparent "control" of instinct, are direct consequences of the maternal instinct. The latter is, of course, itself a derivative of the reproductive instinct. Thus those dispositions, which, in social man, repress instinctive behavior, substitute the dictates of social tradition for their operation, and transform human behavior into a product of traditional heredity pitted against animal instincts, are themselves instinctive reactions, and

are linked with the most fundamental and deepest of inherited impulses.

Instinctive propensities are checked and controlled in the individual by the authority of social tradition because he recognizes that authority, believes in its sanctity and infallibility, is awed by its solemnity. In other words, the controlling action of social tradition is effective because the values which it imposes are accepted as real, and are consequently efficient stimuli to instinctive kinematogenic forces. The ordinary civilized man dreads the power of social tradition and social opinion, and the consequences of disregarding them; the savage observes his tabus because he believes that the breach of them would be fraught with terrible dangers; the Semite and the Christian shudder at the imputation of sin; the man and woman of the world make a cult of social conformity. Consecrated values thus exercise their overpowering suggestion and authority.

But let the primitive savage dread of tabus be outgrown, let criticism or indifference divest the values of tradition of their authority, let these cease from any cause to be *believed* in; their operation as stimuli is then abolished. We are not ruled so much by convention and tradition, except in so far as we dread the consequences of unconformity, as by our acceptance of the values of convention and tradition. When those values become sapped by criticism or skepticism, the whole mechanism of control which social tradition exercises over biological instinct is jeopardized.

It is assumed as an ethical axiom that the chief duty of man is to control and even to suppress his instincts. The term instinct is generally understood to connote in man something evil, base, offensive, and culpable. Civilization has been defined as the repression of instincts, although the description is quite erroneous, the direct operation of biological instinct being quite as strongly checked in the savage as in civilized man. It may appear strange at first sight that the fundamental springs of living activity, the guiding forces which have inspired all the efforts and strivings of life from the beginning, should be branded as vile. Why should man consider it to be his chief task to combat natural instincts?

The reason, doubtless, lies partly in the old conception, which modern psychology appears to find it difficult to cast off, that instincts represent the particular determinants of animal behavior, while man is governed by reason and moral principles. But the main ground for that attitude is more valid. The conditions upon which

human life and behavior depend differ entirely from those which condition animal behavior, and are without an exact parallel in the animal world. The traditional values which govern human behavior have reference to social conditions and relations. Such conditions and such relations are peculiar to the human species; they differ from any to be found in infra-human life.

There exists a general misconception on the subject. Reference is constantly made, as to a fact indisputable, to "animal societies." If, however, that inconsiderate assumption be examined, it will be found to be devoid of real foundation. There exists, properly speaking, no animal society. Insect communities are a special form of reproductive group, and the activities of the "social" insects have no other function than reproduction, and spring from no other instinct than the reproductive instinct. The class of insects lies outside of the line of human, and even of vertebrate, evolution. Among the higher animals, the favorite examples of so-called "social communities," such as those of beavers, of prairie-dogs, of which descriptions have been reproduced from time to time from old books, are known to be fabulous fictions. Those animals which are usually described as gregarious because they are found in large assemblages are characterized by the conspicuous absence of any rudiments of social instincts; maternal and parental care, and the reciprocal filial relation, as well as every manifestation of general intelligence, are markedly undeveloped among the "gregarious" herbivores as compared with the incomparably superior solitary carnivores. In packs of animals of the canine tribe, which are as a rule quite temporary and fortuitous assemblages, the existence of any cooperative social adjustment is more than questionable. They are, says one excellent authority, "the meanest brutes on earth" (6, p. 283). Of "imitativeness," of any manifestation of group-mentality, Dr. Chalmers Mitchell observes that "there is no real evidence outside the group of monkeys" (15, p. 253). It is among them also that the sole analogue and germ in the animal world of the social relations and social instincts is most strongly developed. The relation between mothers and their offspring, the parental, or more properly the maternal instinct—for the male takes as a rule little or no part in those relations, and is very commonly absent from the group which is formed by them—constitute the sole animal rudiment of those social relations and instincts which are paramount in the human world.

Those rudimentary social relations and the instinctive dispositions

which go with them are greatly accentuated in the human family, where infancy is so prolonged as to render the filial and parental relation virtually permanent. To those conditions is superadded the psychic communication afforded by language, by means of which the social tradition has become an independent entity transmitted by the social medium. To those circumstances the emergence of the human race and of conceptual consciousness have been due. The social instincts are derivatives of the maternal instincts (5, p. 80; 13, p. 71).

Social values being prescriptively human, and all human values being chiefly related to social conditions, it is apparent that they should differ in general from those which have operated throughout the greater part of organic evolution, and should appear opposed to "animal" instincts. The latter are pre-social and non-social. They are to a large extent unadapted to the specific conditions which dominate human relations and human conceptual mentality. Social instinct-values are, like all others, derived from an instinctive source, the maternal instinct. The innumerable derivative values, which, in human mentality, have grown out of the germ of the social instincts in the animal mind, and from the conditions to which its operation has given rise, thus come to appear antagonistic to the pre-social values of purely animal instincts.

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L'INSTINCT, L'HÉRÉDITÉ, ET LA TRADITION SOCIALE

(Résumé)

L'importance de l'instinct dans les conceptions modernes de la dynamique mentale n'est pas due à l'existence de formes fixes d'action dans le comportement humain, mais à celle de motifs fonctionnels qui ne correspondent pas aux motifs conscients, et sont les mêmes que ceux qui gouvernent le comportement instinctif chez les animaux. On peut ramener tous les motifs fonctionnels aux impulsions primaires qui assurent la préservation, la nutrition, et la reproduction de l'organisme. La classification naturelle des facteurs héréditaires du comportement est un arbre phylogénétique. La fixation de ces facteurs varie des tendances généralisées aux formes spécialisées d'action, et le progrès de l'organisation tend à empêcher cette fixation. Nul trait caractéristique selon lequel on a défini l'action instinctive n'y est propre, à vrai dire. Les instincts sont les facteurs hérités du comportement, mais ne diffèrent pas des facteurs acquis dans leur mode d'opération.

Les corrélatifs organiques des facteurs hérités ne sont pas nécessairement nerveux, mais peuvent être protoplasmiques ou hormonaux. Dans toute réaction tout l'organisme est impliqué. Dans le développement embryonnaire, les activités morphogénétiques et kinématogénétiques sont transmises et opèrent de la même manière. L'évidence de l'existence de "caractères unités" n'influe pas sur les conclusions historiques à l'égard de la transmission des facteurs héréditaires dans le comportement.

La forme de toutes les opérations de l'instinct chez l'homme est déterminée par les facteurs acquis. Ce contrôle-ci a lieu par l'opération des valeurs

et des états affectifs. Ceux-ci sont les stimuli psychiques de toute réaction instinctive, et le mécanisme du contrôle des instincts chez l'homme ne diffère pas de celui de l'action purement instinctive chez les animaux inférieurs. Les instincts sociaux sont les facteurs dominants du contrôle dans le comportement humain. Ils dérivent des instincts filiaux, lesquels dérivent à leur tour des instincts maternels et reproducteurs. Leur développement exceptionnel chez l'homme est le résultat de l'enfance prolongée, et de la croissance humaine dans une condition de dépendance.

BRIFFAULT

INSTINKT, VERERBUNG UND GESELLSCHAFTLICHE TRADITION

(Referat)

Die Bedeutung von Instinkt in der modernen Lehre von den geistigen Kräften beruht nicht auf der Existenz von fixierten Handlungsvorbildern des menschlichen Verhaltens, sondern auf dem von funktionellen Motiven, die nicht mit bewussten Motiven übereinstimmen. Sie sind identisch mit denen, die das instinktmässige Verhalten der Tiere beherrschen. Alle funktionellen Motive lassen sich auf primäre Reize zurückführen, durch die die Selbsterhaltung, Ernährung und die Reproduktion des Organismus gesichert sind. Die natürliche Klassifikation von Vererbungsfaktoren des Verhaltens ist ein phylogenetischer Baum. Die Bestimmtheit dieser Faktoren variiert von allgemeinsten Trieben zu spezialisierten Handlungsvorbildern, und die Entwicklung ihrer Organisation geht in der Richtung der Aufhebung einer Fixierung. Kein Merkmal, wodurch die instinktive Handlung definiert worden ist, ist ihr genau genommen eigentümlich. Instinkte sind die ererbten Faktoren des Verhaltens, sind aber in der Beschaffenheit der Wirkung nicht verschieden von erworbenen Faktoren.

Das organische Korrelat der vererbten Faktoren gehört nicht notwendigerweise zum Nervensystem, sondern kann auch protoplasmischer Art sein. In jeder Reaktion ist der ganze Organismus einbezogen. In der embryonalen Entwicklung ist morphogenetische und kinomatogenetische Tätigkeit übertragen und in gleicher Weise wirksam. Das Beweismaterial für die Existenz von "Einheitsmerkmalen" ist nicht derart, dass es historische Schlüsse bezüglich der Übertragung von Vererbungsfaktoren im Verhalten beeinflussen könnte.

Die Form aller instinktiven Tätigkeit beim Menschen ist bestimmt durch erworbene Faktoren. Jene Beherrschung findet durch die Tätigkeit affektiver Zustände und Werte statt. Dies sind die psychischen Reize jeder instinktiven Reaktion, und der Mechanismus der Instinktherrschaft beim Menschen ist nicht verschieden von dem der reinen Instinkthandlung in niedern Tieren. Die sozialen Instinkte sind die vorherrschenden Herrschaftsfaktoren im menschlichen Verhalten. Sie sind von Tochterinstinkten abzuleiten, die sich ihrerseits von mütterlichen und reproduktiven Instinkten herleiten. Ihre aussergewöhnliche Entwicklung beim Menschen ist das Ergebnis einer verlängerten Kindheit und des menschlichen Wachstums unter den Bedingungen der Abhängigkeit.

BRIFFAULT

SEX DIFFERENCES IN CERTAIN IMMIGRANT GROUPS*¹

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This study presents a discussion of sex differences revealed in a body of data already used in the study of certain differences in intelligence among certain immigrant groups in this country (7). Table 1 shows the relatively equal distribution of the sexes in the groups studied.

The purposes of the study may be stated as follows: (1) to survey the sex differences in the various groups, American and immigrant, as shown in tests using the Army Alpha and Beta and the combined Alpha and Beta, and (2) to survey the sex differences among these various groups as revealed in the individual tests of the two scales, Alpha and Beta. This feature of the survey will indicate how far any differences in the respective scales may be due to differences within particular tests which make up the respective batteries.

The statistical methods employed are as follows: (1) the computation of the median and respective tenth percentiles; (2) the computation of the semi-interquartile range; and (3) the computation by the graphic method of the percentage of overlapping of one group upon another.²

I. COMPARISON OF SEXES IN VARIOUS NATIONALITIES IN ALPHA AND BETA

Table 2 shows the percentage at each quartile that the boys overlap the corresponding quartile for the girls.

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¹This is a summary of a more extended paper. Lack of space prevents the inclusion of curves of the distributions.

²The writer is indebted to J. E. Coover, of Stanford, for the suggestion to use the graphic method to measure overlapping. Such method is quite defensible in view of the nature of the data.

TABLE 1
DISTRIBUTION OF THE SEXES: TWELVE-YEAR-OLD CHILDREN*

Groups	Number of	
	Boys	Girls
A. Comparison of Sexes in Alpha Scale		
American	168	146
South Italian	108	83
Portuguese	40	37
Spanish-Mexican	28	23
B. Comparison of Sexes in Beta Scale		
American	162	145
South Italian	108	84
Portuguese	40	35
Spanish-Mexican	29	24
C. Comparison of Sexes in Combined Alpha and Beta Scales		
American	162	143
South Italian	106	81
Portuguese	40	34
Spanish-Mexican	28	23

*The children who were tested in this study were "twelve years old but not yet thirteen." They came from the public schools of San Jose, California, and surrounding territory.

TABLE 2
PERCENTAGE OF BOYS EQUALLING OR EXCEEDING THE GIRLS AT THE QUANTILES

Groups	Alpha Test			Beta Test		
	Q_1	Md.	Q_3	Q_1	Md.	Q_3
American	60.0	34.5	19.3	69.0	48.0	27.0
Italian	64.0	46.0	26.0	67.5	50.0	23.5
Portuguese	54.0	24.5	16.0	61.0	30.0	13.0
Spanish-Mexican	66.0	32.5	17.0	67.0	42.5	26.5

Table 3 gives the medians, quartile deviations, and tenth percentiles of the sexes in the several groups.

1) *Alpha Differences.* For the American group the distributions show that the girls are, throughout, superior to the boys, but that the latter approach the girls more closely in the upper ranges. If we examine Table 3, which gives the semi-interquartile range as well as the percentiles, we note that when the figures of dispersion are taken into account, this superiority is not so completely maintained throughout. The semi-interquartile range for the American boys is 21.0, for the girls, 19.21. Thus, although

TABLE 3
 MEDIAN, QUARTILE DEVIATIONS, AND PERCENTILES OF BOYS AND GIRLS OF
 THE VARIOUS NATIONALITY GROUPS OR SUB-RACES

Nationality groups		Sex	Median	Q	5	10	20	25	30	40	50	60	70	75	80	90	95
Alpha Tests	Americans (S. J.)	Boys	52.28	21.00	15.90	22.17	31.30	35.50	39.64	45.43	52.28	61.31	69.31	77.50	83.50	96.70	105.10
		Girls	65.21	19.21	22.79	31.50	41.60	45.25	48.90	57.88	65.21	72.30	79.61	83.67	87.72	100.17	111.39
	Italians (S. J.)	Boys	23.50	15.75	1.74	3.47	7.03	8.83	11.20	16.41	23.50	30.79	37.30	40.33	44.83	62.25	72.00
		Girls	25.75	14.19	2.67	5.80	11.42	13.15	15.63	21.86	25.75	30.30	38.60	41.53	44.13	51.63	59.13
	Portuguese	Boys	17.00	12.71	.82	1.64	3.27	4.09	5.75	11.17	17.00	21.17	24.50	29.50	34.50	56.50	67.00
		Girls	29.00	15.32	4.16	6.20	10.17	13.25	16.33	25.30	29.00	35.70	39.40	43.88	51.00	67.92	90.25
	Spanish-Mexicans	Boys	17.83	13.13	1.58	3.15	6.50	8.25	10.00	13.50	17.83	25.50	29.00	34.50	40.83	50.50	57.50
		Girls	28.25	16.25	2.59	5.00	8.83	11.38	14.25	22.50	28.25	32.50	38.63	43.88	51.50	61.25	63.13
Beta Tests	Americans (S. J.)	Boys	68.92	8.16	47.51	51.20	56.96	59.09	61.31	65.54	68.92	71.54	72.46	75.41	77.54	82.19	84.73
		Girls	68.85	6.90	46.31	52.96	60.86	62.88	64.82	66.83	68.85	71.42	74.44	76.67	79.08	83.92	87.72
	Italians (S. J.)	Boys	54.01	12.11	26.75	32.00	38.61	41.89	45.39	50.18	54.01	60.63	64.00	66.11	68.75	76.58	81.35
		Girls	55.52	9.36	22.50	30.75	44.42	46.42	48.17	52.20	55.52	58.75	62.97	65.13	66.75	70.18	73.18
	Portuguese	Boys	48.32	9.59	24.75	28.50	32.25	40.58	42.25	45.46	48.32	51.75	56.43	59.75	62.25	68.08	74.75
		Girls	56.25	10.73	30.69	32.88	42.25	45.00	48.92	52.75	56.25	59.75	66.00	66.45	68.92	72.88	76.00
	Spanish-Mexicans	Boys	51.63	12.09	15.38	31.25	39.25	41.83	44.25	48.00	51.63	55.42	61.25	66.00	68.42	75.00	*
		Girls	54.75	8.88	28.75	35.75	43.75	46.00	47.50	50.75	54.75	58.35	61.95	63.75	65.55	69.15	72.75
Combined Alpha and Beta Tests	Americans (S. J.)	Boys	122.51	28.81	66.93	76.46	88.40	93.62	98.85	110.71	122.51	133.68	145.23	151.23	157.23	172.55	183.35
		Girls	135.96	24.71	81.52	92.52	106.37	111.30	116.23	125.41	135.96	145.82	155.68	160.71	166.21	177.21	189.38
	Italians (S. J.)	Boys	78.64	27.57	27.57	37.20	40.52	51.83	56.25	66.86	78.64	89.86	101.08	106.97	112.86	130.75	151.08
		Girls	83.25	21.51	26.58	39.93	55.66	61.14	65.64	78.86	83.25	91.35	99.45	104.16	108.93	118.46	134.50
	Portuguese	Boys	65.20	21.37	23.75	31.75	43.39	47.02	50.66	57.93	65.20	72.48	79.75	89.75	99.75	119.75	*
		Girls	87.75	27.14	34.00	44.42	55.75	61.18	66.04	75.75	87.75	99.75	110.61	115.46	120.75	146.75	169.25
	Spanish-Mexicans	Boys	72.25	20.67	22.42	31.75	46.15	51.75	57.35	65.25	72.25	79.25	88.42	93.08	97.75	121.75	135.75
		Girls	81.42	21.63	40.35	43.95	54.15	58.75	63.35	72.55	81.42	89.42	96.75	102.00	113.75	128.25	134.00

*These could not be computed on grouped data.

the girls exceed the boys in median performance, the variability of the latter is greater than that of the former. For the Italians, the girls exceed the boys in the lower ranges, while the boys excel the girls in the upper. The Italian boys are slightly more variable than the Italian girls. The figures for the Portuguese reveal more marked differences than do the corresponding figures for the Americans and Italians. The girls, throughout, prove themselves superior to the boys both in average performance and in variability. An examination of the scores showed that the sample was rather small and that there were a number of exceptionally high scores among the Portuguese girls which may account for the divergence from the other groups. A somewhat similar superiority of the Spanish girls over the boys of their group is shown, but there seems no disturbing factor here as with the Portuguese.

Throughout the Alpha battery, therefore, the girls in all groups do much better than the boys, on the average, and in two of the groups, they, in addition, prove themselves more variable. The superiority in variability, incidently, for the Americans and Italians is not nearly so great on the part of the boys as is the superiority in averages on the part of the girls. In short, even admitting that the samples are too small for the Portuguese and Spanish-Mexicans, I think we must conclude that not only do the boys prove inferior to the girls in average performance but also that the girls practically equal them in variability.³

2) *Beta Differences.* The Beta results reveal no such marked differences as the Alpha. Moreover, the curves of distribution of

³It must be borne in mind that in the Alpha at least seven-eighths of its make-up demands knowledge of the English language in order to manipulate. In over 50% of the test, the material is of such nature that language functions directly in its operation. For the American group, the sex difference could hardly be explained on grounds of differences in language ability, and for the Latin groups, with the constant statement that language is a tremendous handicap, one would naturally expect the boys and girls to be much nearer together in performance than these figures show. Moreover, with the usual assumption that the girls of foreign-families remain for a longer time under the domination of the European atmosphere—due to mother and home contacts—one might suppose that, did the language factor operate as completely as has been assumed, this factor would operate here. We shall have reason to see below that the girls continue to maintain their superiority throughout the separate tests, and exactly in those where one might expect them to be handicapped on the language side.

percentiles are somewhat more irregular, showing possibly some disturbing factors in the test results.⁴ (Curves omitted here.)

For the American group, the girls tend to excel the boys slightly except at the very outset and again at the middle range where the boys do slightly better than the girls. The boys are rather more variable than the girls. For the Italian group, the percentiles show that the girls do better than the boys at some points in the distribution, but that at the median the boys excel the girls. The Italian boys are more variable than the girls of their group. With the Portuguese, the distributions are relatively regular, with the girls exceeding the boys throughout. So, too, the Portuguese girls are more variable than the boys. However, the marked superiority of the girls over the boys in the upper ranges is not shown in Beta as in Alpha, due doubtless to lack of extension in the scale which would permit the brighter Portuguese girls to show their real ability. This not only retards the averages but keeps the dispersion at a lower figure than it might otherwise be.⁵ With the Spanish-Mexican group, the sexes do not show any marked divergences in the distributions. At the median the girls exceed the boys slightly, but at the third quartile, the boys are slightly superior to the girls. The boys are decidedly more variable in this test than the girls. Actually, the Beta seems to measure more adequately the Spanish-Mexican groups than the Alpha. Of all the groups which took the Beta test, the results for this group show the most consistent results, statistically speaking.

For the Beta battery as a whole, the girls do not exceed the boys so consistently in their performances as they do in Alpha, and in variability, the boys, with the exception of the Portuguese groups, excel the girls.

3) *Differences in Combined Alpha and Beta.* Table 4 reveals the overlapping at the quartiles when the Alpha and Beta scores are combined into one scale. This putting the two batteries into one gives, no doubt, a better measure of intellectual performance than either scale alone.

⁴In the first place, the Beta test is decidedly motor and perceptual throughout. As I have indicated elsewhere, it is in all likelihood somewhat unfair, as a measure of mental ability, to the brighter children who practically complete all the items in the tests and, therefore, do not have an opportunity to indicate their real capacities in the upper ranges of ability. Cf. (7).

⁵Cf. footnote 4.

TABLE 4

PERCENTAGE OF BOYS EQUALLING OR EXCEEDING THE GIRLS AT THE QUANTILES

Groups	Q_1	Combined Alpha and Beta Md.	Q_3
American	60.0	37.5	18.0
Italian	65.0	45.5	27.0
Portuguese	55.5	25.5	11.0
Spanish-Mexican	68.0	38.0	18.0

In the American group, the girls maintain their superiority in average performance throughout, but the boys excel the girls in variability (cf. Table 3). For the Italians, the girls excel the boys in the lower ranges, but not in the upper. At the median the girls are slightly superior. As in the American groups, the Italian boys prove themselves more variable than the girls. For the Portuguese, the girls excel the boys of their nationality both in average performance and in variability. In the latter the girls show a variability over the boys which is nearly the reverse of the situation found among the Italians. In the case of Spanish-Mexican groups, the girls tend throughout to surpass the boys, except at the 95th percentile. The variability of the girls in this group is slightly higher than that of the boys.

In general, we may say that for the combined Alpha and Beta, the differences are about the same as found in the separate batteries. But since the Alpha battery contributed double the amount of Beta to the combined scores, we naturally find that the measures of averages and overlapping and of dispersion approach those found in the Alpha battery more closely than in those in Beta.

4) *Summary.* In the general comparisons of the sexes in the Alpha, Beta, and combined Alpha and Beta, the girls surpass the boys in the big bulk of the measures of averages, but in only four out of twelve instances do the girls excel the boys in variability. Thus, so far as the first purpose of our study is concerned, our results confirm, for certain nationality groups, the earlier findings reported by Starch and Thorndike for American groups (3, 4). On the whole, then, we may say that the girls excel the boys in measures of averages, but that the boys are the more variable.

It is worth noting, further, that the Latin groups show that the girls, at least in two out of the three nationalities, do better with the Alpha, which demands language, in comparison with the boys of

their group, than do the American girls. Of all four groups, the Italian boys and girls are nearer together in Alpha than the other groups. The question may be raised whether or not the alleged language handicap for the girls can be considered as much a handicap with the Latins as is frequently asserted. Certainly it would seem that for the Portuguese and the Spanish-Mexicans this argument is not particularly pertinent. On the other hand, the fact that the American girls surpass the boys of their group rather leads one to suspect that the girls actually do better throughout, and, in turn, are superior in general ability as measured by the Alpha test.⁶

II. COMPARISON OF SEXES OF VARIOUS NATIONALITIES IN THE INDIVIDUAL TESTS OF ALPHA AND BETA

The analysis of the sex differences in the individual tests is at best rough. Only the three most significant percentiles were computed: the 25th or Q_1 , the 50th or Q_2 , and the 75th or Q_3 . From these the quartile deviation or semi-interquartile range was determined. These give measures of variability dependent on the distribution without any assumptions as to the application of the Gaussian curve of probability.⁷ These figures are given in Table 5. Table 6 gives the percentage of overlapping of the two sexes for each sub-racial group at the Q_1 and Q_2 . We may make some brief notation of the results for each of the separate tests.

1) *Alpha Differences in the Separate Tests.* In *Alpha 1*, which is a test of oral directions, involving immediate memory and language comprehension, with the American, Italian, and the Portuguese, the girls exceed the boys, on the average. In variability, the boys in the American, Italian, and Spanish-Mexican groups are slightly better than the girls. In the Spanish-Mexican group, the boys excel the girls slightly, on the average. In the Portuguese, the girls surpass the boys in variability, which superiority of the girls

⁶It must be recognized, as Woodrow has shown, that 12-year-old girls are physically advanced over boys of similar age. This may be a factor in their superiority. Cf. below.

⁷While the results from this sort of computation may not appear so accurate as they might be by the use of more involved statistical procedures, the writer feels that these simple measures do not do unnecessary violence to the data in the interests of mere statistical analysis. Statistics cannot make data rise higher than their source, and, in material like that given here, there is nothing gained by forcing the distributions under the normal probability curve. Cf. (1).

TABLE 5
 MEDIAN, 25TH AND 75TH PERCENTILES, AND QUARTILE DEVIATIONS FOR SEPARATE TESTS IN ALPHA AND BETA
 FOR VARIOUS NATIONALITY GROUPS

Group	Sex	Alpha tests							Beta tests							
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7
P_{25}	Boys	2.96	3.90	4.09	1.07	2.71	2.73	4.24	7.38	3.32	6.05	8.69	11.50	11.01	11.13	3.42
	Girls	3.94	4.13	5.50	4.22	3.50	3.81	6.50	9.05	2.84	4.30	9.56	10.67	14.44	9.83	3.34
P_{50}	Boys	5.21	5.66	6.29	4.78	5.60	4.96	8.54	12.30	3.89	8.02	9.69	13.72	13.71	13.56	5.53
	Girls	5.60	5.80	6.93	8.63	7.27	6.09	11.32	12.44	3.63	6.27	10.23	14.95	17.41	11.65	4.90
P_{75}	Boys	6.96	7.48	8.18	10.79	9.39	7.29	13.07	17.31	4.36	10.00	10.50	16.21	16.37	15.63	7.50
	Girls	7.41	7.53	8.25	13.04	10.28	8.35	16.93	16.45	4.14	8.22	11.18	17.57	20.43	13.84	6.72
Q	Boys	2.00	1.79	2.05	4.86	3.34	2.28	4.42	4.98	.52	1.98	.91	2.36	2.68	2.25	2.04
	Girls	1.74	1.70	1.38	4.41	3.39	2.27	5.22	3.70	.65	1.96	.81	3.45	3.00	2.01	1.69
P_{25}	Boys	.70	1.37	.47	.33	.18	.08	.52	1.16	2.31	2.13	7.25	7.75	10.44	7.52	1.16
	Girls	1.09	1.06	.82	.38	.33	.41	1.03	2.12	1.60	1.35	7.60	8.71	12.78	6.77	1.61
P_{50}	Boys	2.35	3.33	2.15	1.15	2.33	2.05	1.64	4.46	3.19	5.85	9.07	10.98	13.65	9.66	2.90
	Girls	2.57	2.66	2.85	1.26	2.31	2.88	3.73	3.62	2.69	3.91	9.12	12.44	15.56	8.41	3.13
P_{75}	Boys	4.04	5.67	5.11	3.71	5.25	4.89	5.40	8.92	3.94	8.72	10.26	14.36	16.41	12.15	5.02
	Girls	3.94	4.36	4.81	4.18	5.48	4.68	6.69	8.04	3.46	6.34	10.18	15.29	18.58	10.17	4.49
Q	Boys	1.67	2.15	2.32	1.69	2.54	2.41	2.44	3.88	.82	3.30	1.51	3.31	2.99	2.32	1.93
	Girls	1.43	1.65	2.00	1.90	2.58	2.14	2.83	2.96	.93	2.50	1.26	3.29	2.90	1.70	1.44
P_{25}	Boys	.17	.96	.03	.15	.06	.17	.50	.61	2.72	2.25	5.05	6.33	9.19	7.94	1.22
	Girls	1.17	1.23	.32	.78	1.00	2.07	1.30	3.78	2.32	2.25	7.75	10.75	11.25	6.94	1.59
P_{50}	Boys	1.06	2.10	.64	.79	.72	1.22	1.50	2.83	3.58	5.57	7.25	8.79	11.42	10.22	2.57
	Girls	2.90	2.25	1.75	1.14	4.07	3.17	4.83	6.70	3.13	3.63	9.64	13.87	14.88	8.75	2.88
P_{75}	Boys	2.88	3.75	2.50	1.44	2.50	4.10	5.50	7.50	4.13	7.94	9.25	11.11	15.31	11.23	4.04
	Girls	4.10	5.00	4.50	3.50	6.25	5.17	10.17	10.50	3.85	5.75	10.43	16.63	17.31	11.15	4.92

TABLE 5 (continued)

Group	Sex	Alpha tests								Beta tests						
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7
Q	Boys	1.36	1.40	1.29	.65	1.22	1.97	2.50	3.45	.71	2.85	2.10	2.39	3.06	1.65	1.41
	Girls	1.47	1.89	2.09	1.36	2.63	1.55	4.44	3.41	.77	1.75	1.34	2.94	3.08	2.11	1.67
P_{25}	Boys	.90	.90	.38	.20	.00	.75	.28	1.25	2.60	4.13	6.63	7.63	8.13	6.75	.82
	Girls	.46	1.65	.32	.39	.32	1.08	.60	2.25	2.17	2.50	8.10	9.50	11.17	6.00	1.30
P_{50}	Boys	2.30	2.17	1.50	.90	.50	2.75	1.06	4.50	3.15	6.00	8.63	10.50	12.00	9.67	2.75
	Girls	2.29	2.80	3.00	1.27	3.13	3.38	2.25	5.00	3.17	4.50	9.30	11.90	13.83	9.50	2.33
P_{75}	Boys	4.00	4.00	4.17	2.16	4.00	4.50	4.83	8.83	3.84	9.79	9.97	14.00	15.25	12.88	4.42
	Girls	3.35	4.06	5.31	7.00	5.75	4.63	10.13	8.13	3.90	7.00	10.13	15.50	17.50	11.00	4.17
Q	Boys	1.55	1.55	1.90	.98	2.00	1.88	2.28	3.79	.62	2.83	1.67	3.19	3.56	3.07	1.80
	Girls	1.50	1.21	2.50	3.31	2.72	1.78	4.77	2.94	.87	2.25	1.02	3.00	3.17	2.50	1.44

TABLE 6
PERCENTAGE OF BOYS EQUALING OR EXCELLING THE GIRLS AT THE FIRST QUARTILE AND AT THE MEDIAN
IN THE SEPARATE ALPHA AND BETA TESTS

Group	Q and md.	Alpha tests								Beta tests						
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7
American	Q	62.5	69.5	56.5	54.5	69.0	64.0	61.0	67.0	62.5	98.0	50.0	85.0	41.5	93.75	77.0
	Md.	42.5	46.0	41.0	35.0	39.0	39.0	34.5	47.5	56.0	74.0	35.0	38.0	17.5	70.5	56.5
Italian	Q	68.0	76.5	68.75	71.0	72.0	70.5	57.5	69.5	69.0	79.0	70.0	69.5	55.5	86.0	68.75
	Md.	45.0	60.0	46.5	47.5	50.5	43.0	37.0	57.0	45.0	63.0	45.0	38.5	33.5	66.0	42.5
Portuguese	Q	47.5	68.75	68.0	51.5	46.0	42.5	65.0	46.0	48.0	75.0	45.0	27.5	52.0	83.5	68.75
	Md.	21.0	47.0	35.0	34.5	7.0	32.5	32.5	30.0	24.0	65.0	20.0	5.0	27.5	66.0	45.0
Spanish-Mexican	Q	81.75	62.5	77.5	71.0	68.75	71.0	63.0	68.75	87.5	95.0	55.0	59.0	55.0	82.0	81.5
	Md.	51.0	41.0	35.5	43.0	31.5	43.0	43.0	47.5	52.0	70.5	32.5	41.0	37.5	52.5	43.0

may be due to the chance factor of a few cases of exceptionally high ability among the girls of this group. It is worth noting that the Latin girls tend to duplicate the performance of the American girls in this test in reference to the boys of their particular groups.

In *Alpha 2*, an arithmetic reasoning test, there is no constant or great advantage accruing to either sex in average performance, although, in three-fourths of the groups, the girls do somewhat better than the boys.⁸ In matters of dispersion, the boys of the American, Italian, and Spanish-Mexican groups are more variable than the girls. With the Portuguese, however, the girls are somewhat more variable than the boys.

For *Alpha 3*, a test of "practical judgment," there is less consistency than in the former two tests. Throughout, the girls excel the boys in the measures of averages. But, in variability, the boys surpass the girls in the American and Italian groups, but lag behind the girls in the other two groups. On the whole, the Portuguese and Spanish-Mexican girls excel the boys of their group in both variability and average performance.

Alpha 4, a synonym-antonym test quite distinctly dependent upon knowledge of English, is really a form of vocabulary and controlled association test. It is one of the most diagnostic of all the Alpha battery. At the median, the girls excel the boys uniformly, but, with the Portuguese and Spanish-Mexicans, the girls exceed the boys in the upper ranges of the test, perhaps due, again, to the existence of some exceptionally high scores among the girls of this group. In variability, the Italian and American groups are fairly close together, but with the other two groups, the girls far surpass the boys. With the Portuguese the quartile deviation for the girls is double that for the boys; with the Spanish-Mexican groups that for the girls is over three times as great as the deviation for the boys. This marked difference, however, is due to the piling up of cases of the boys in the lower end of the scale. Had not three-fourths of the cases been concentrated there, the quartile deviation might not have been so divergent in the two groups. An inspection of the scores of the Spanish-Mexican and Portuguese boys shows that the test was too

⁸Starch found, however, in 1250 cases of boys and in the same number of girls, in the public schools, that in arithmetic reasoning the boys did better than the girls. Moreover, 60% of the boys exceeded the median for the girls. [Cf. (3, p. 68).] This agrees with our own figures for the Italians only. Apparently his subjects were all Americans.

difficult for them. That is to say, the range of the test was too restricted. Had easier items been introduced at the lower end of the scale, then those cases that piled up around the zero score might have been distributed over the range more uniformly.

Alpha 5, the disarranged sentence test, is difficult to classify psychologically, yet it proves fairly adequate to distinguish between the bright and the dull. Certainly it is highly linguistic in nature and involves not only word knowledge, but judgment of truth and falsity based upon meanings. In the measures of averages, the Italian sexes were practically alike, but in the American and Spanish-Mexican groups the girls excelled the boys, and with the Portuguese the girls far outstripped the boys, only 7% of the latter reaching or exceeding the median for the girls. In the matter of variability, the American and Italian sexes are equivalent; for the Spanish-Mexicans the girls are somewhat more variable, and for the Portuguese the girls are decidedly more variable, having a quartile deviation of 2.63 as compared to 1.22 for the boys of that group.

Alpha 6, called the "number checking" test, is one of the most diagnostic tests in the Alpha battery. It is not highly dependent upon language ability for manipulation. It is, perhaps, rather to be thought of as a form of reasoning test. In the measures of averages, the girls are uniformly superior to the boys in this test, and in the case of the Portuguese the girls far outstrip the boys. In dispersion, there are no marked differences in the sexes in the various groups. In the Italian and Portuguese groups, the boys excel the girls slightly. In the other two the differences are negligible. In the case of the Portuguese, the distribution of scores for the boys is distinctly skewed toward the lower end of the scale, with a considerable number of scores centering around the zero point. As pointed out in discussing a similar situation for Alpha 5, had the scale been extended at the lower end, the distribution might have been more like the normal probability curve.⁹

⁹It is not always justifiable to treat such concentration of scores around the lower or upper part of a scale as if the curve were a truly truncated one. Often, the very concentration of scores around the extremes may reveal inadequacies in the test which ought to be corrected. In such data as the group intelligence tests are bound to give, little is gained in elaborate statistical manipulation of these concentrated scores in an effort to redistribute them under the Gaussian normal probability curve. Cf. (6, pp. 629-633) and the balance of the same chapter on statistical techniques.

The superiority of the girls over the boys in this test appears to be a revelation of genuine difference, uninfluenced by adventitious training or nationality differences. The fairly high correlation of this particular test with such outside criteria as grade location indicates its validity as a measure of ability.

Alpha 7 is a test involving the higher mental processes, meaning and logical relationships. It is distinctly dependent on language concepts. In both measures of averages and of dispersion, the girls outstrip the boys, and in some of the groups, especially the Spanish-Mexican and Portuguese, quite markedly so. The distributions of scores in this test, especially with the Latins, approaches the normal probability curve most closely. It appears to be especially valid in its differentiation of bright and dull.

Alpha 8, the test of general information, has been one of the most severely criticized of the whole Alpha battery as being coachable and dependent on chance experience. When the range of material is taken into account, the charge is found to be scarcely valid. As Brigham (2) remarks: "The assumption underlying the use of a test of this type is that the more intelligent person has a broader range of general information than an unintelligent person. Our evidence (from his data) shows that this assumption is, in the main, correct." It is, however, often said that the test is somewhat more favorable to men than to women. Yet, for the American and Spanish-Mexican groups, the boys are slightly inferior to the girls, on the average, although the overlapping is high. For the Italians, the boys excel the girls, but with the Portuguese the girls far outstrip the boys. In variability, the boys, however, are superior to the girls throughout, although in the Portuguese group the boys do not surpass the girls very greatly. Except in this latter group, however, the boys are distinctly superior to the girls in their variability. It would not seem from our data that the girls were handicapped by the make-up of this test, and the writer's experience with this test in college classes, at least, would seem to disprove the frequent assumption that the test unduly favors the male sex.

To summarize the data on the separate tests in the Alpha battery: By and large, the girls excel the boys in every test in Alpha. Only in the case of the Italian boys in the "oral directions," the "synonym-antonym," and "range of information" did they surpass the girls of their group, and with the exception of the first instance this super-

iority was slight. In no case did the American or Portuguese boys excel the girls of their groups in the separate tests. With the Spanish-Mexicans in "oral directions," the boys were slightly superior to the girls. To offset these four instances where the boys excelled the girls, it should be noted that, in a number of the tests, the girls greatly surpassed the boys. In 11 out of the 32 measures of overlapping computed, for the median, only between 30 and 40% of the boys reached or went beyond the median for the girls.

Here, then, we have a detailed analysis of the striking divergence in the total Alpha battery noted in Section I above. Not only do the girls excel the boys in the whole scale, but they tend to surpass them throughout in the individual tests. Furthermore, on the tests requiring language ability, the girls seem uniformly superior to the boys. Such superiority may be accounted for in three ways at least. We may hold that it is due to more regular attendance of the girls than of the boys at school. Unfortunately, the school attendance records are not at hand. This might apply, in part, to some of the boys of the Latin group, for some of these boys do work at certain seasons in the fields and in the canneries of the Santa Clara Valley. This point could scarcely apply to the American boys, however. If it were a mere matter of school attendance, then the American boys ought to equal the performance of the American girls, but they do not do so. Secondly, it may be said that the girls pay more attention to language studies in the schools than the boys. If this were so, it would hardly be reflected here, since none of these tests is specifically linguistic in the school sense, that is, none of them is a test of grammar, rhetoric, or literature as such. Rather the language ability comes into play in the comprehension of direction as in Test 1, in to the meaning needed to manipulate Tests 5, 7, and 8. It is the general factor of language concepts and not some particular feature of linguistics as such. A further point may be made against this thesis. It is true that the Latin girls remain under the influence of the home and the mother longer than do the boys of these groups who are thrown by circumstance into outside contacts where they must learn the English tongue. If the language factor were one of mere fluency, as some writers maintain, then one would expect these home factors to continue to operate much longer for the Latin girls than for the boys of these groups. Yet, the evidence seems to be against this supposition, so far as this group is concerned. The

bulk of the Latin children, as with the American children of North-European ancestry, were born in this country and had come under the school régime at the usual age.¹⁰

A third and more likely explanation of the superiority of the girls in average performance in the separate tests and in the whole battery lies in the fact of advancement of their mental and physical development as contrasted with the boys.¹¹ Unfortunately we have no direct evidence of advancement of the girls over the boys except the test results themselves, although the general observational facts given by teachers, principals, and the examiner himself bear this out. Certainly the Latin girls showed distinct physical maturity in contrast to the boys of both Latin and American groups. In short, it seems to the writer that the superiority of the girls over the boys in average performance is more likely due to physical and mental maturity than to differences in home influences or interest in language materials in the schoolroom.

Some corroboration of this theory is shown from the fact that in tests involving little or no language, in the Alpha battery, such as Test 2, arithmetic reasoning, and Test 6, number checking, the superiority of the girls is still in evidence. If it is true that, with adults, women excel in language and literature and men in mathematics and history, as has been maintained, there is little corroboration of this thesis here.

On the other hand, in 17 out of the 32 measures of dispersion, the boys equalled or exceeded the girls. In only six instances, however, was this superiority marked. These were for the Americans in Tests 1, 3, and 8, for the Portuguese in Tests 2 and 8, for the Spanish-Mexicans in Test 8 only. On the whole, the girls divide the honors with the boys in the matter of variability.

2) *Beta Differences in the Separate Tests.* The corresponding results for the separate Beta tests may be seen by examining Tables 5 and 6. For the Americans in *Beta 1*, maze test, as with the entire Beta scale, the range is greatly reduced due to the relative ease with which the brighter pupils reached the upper limits of the test. Had the test included more difficult items at the upper end,

¹⁰It should be borne in mind that these children were all in the 12-year-age group, and largely from the same economic status.

¹¹Cf. (5, pp. 31, 103, 110-117, 121). Woodrow shows that advanced maturity is important in accounting for excellence of girls over boys before adolescence.

the dispersion would have been greater throughout. In measures of averages, the American and Spanish-Mexican boys excel the girls slightly; and, with the Italians, the girls are slightly superior to the boys. With the Portuguese, the girls far outstrip the boys. In all cases, the girls are more variable than the boys, especially so in the case of the Americans, Italians, and Spanish-Mexicans, although for all groups the shortness of the range affects the matter of dispersion.

Beta 2, cube analysis, although hard to classify psychologically, seems one of the most diagnostic tests. Moreover, the range of the test is much more adequate to differentiate the abilities of the particular groups under consideration. In overlapping at the median, the boys tend, on the whole, to excel the girls, and in the case of the American, Italian, and Spanish-Mexican groups rather noticeably. Moreover, the boys also excel the girls throughout in variability, except in the American group where the two practically overlap. With the Spanish-Mexican group, the differences are not great, but with the other two Latin groups, it is marked. It would seem, however, that in this test we have a true sex difference in favor of the boys. Certainly neither language nor coaching can have played any part in the results.

Beta 3, a type of completion test, seems to contain too many easy items for these groups. The range is thus greatly restricted. In measures of overlapping at the median, the Italian girls are slightly better than the boys of that group, but with the other three groups, the girls far outstrip the boys. In variability, the Portuguese boys excel the girls very much, but, in the other groups, the differences are not so distinct, although the boys retain their superiority.

Beta 4, the digit-symbol test, is a type of substitution test, and falls in its diagnostic use between the simpler type of completion test, like Test 3, and the more difficult tests, Numbers 5, 6, and 7. In the matter of overlapping at the median, the girls exceed the boys throughout. In the American, Italian, and Spanish-Mexican groups this amounts to about 10% superiority. But with the Portuguese only 5% of the boys reach or exceed the median for the girls of that group. The differences in median score in the Portuguese is very great; the boys have but 8.79, the girls, 13.87. In variability, the Italian and Spanish-Mexican boys excel the girls slightly. With the Portuguese, the girls are somewhat more variable and with the American group the girls markedly surpass the boys.

Beta 5, number checking, is fairly diagnostic. In overlapping at the median, the girls excel the boys throughout, and in the American group this superiority is very marked. In variability, the Portuguese sexes are practically alike, but in the other Latin groups, the boys are somewhat more variable. With the Americans, the girls are somewhat more variable.

Beta 6, picture completion, has been one of the most universally used forms of performance test. It seems quite diagnostic for our groups. With the Spanish-Mexicans the median scores practically overlap with a slight advantage accruing to the boys, but with the other three groups the boys far outstrip the girls. In dispersion, the Portuguese girls are distinctly more variable than the boys of their group. In the other groups, the boys surpass the girls noticeably. It would seem that, so far as median performance is concerned, there is a true sex difference in favor of the boys; but the data on variability are less conclusive, the results for the Italian group being about the reverse of those for the Portuguese, with the Americans showing no marked differences and the Spanish-Mexicans only moderate superiority in favor of the boys.

Beta 7, geometrical construction, approaches a form of reasoning test. It is a fairly good diagnostic measure for our groups. For the Americans, the boys excel the girls at the median about 6%, but, in the Latin groups, the girls surpass the boys by about the same amount. In variability, the American, Italian, and Spanish-Mexican boys all show superiority to the girls in their respective groups. With the Portuguese, however, the girls are slightly more variable than the boys.

To summarize, briefly, the results on the individual Beta tests, we find that in the matter of median performance, the boys excel the girls in 9 out of the 28 distributions on the tests for the four groups, that the boys overlap the girls at the median in two instances, and fall below them in 17 cases. As to variability, the boys are more variable than the girls in 16 cases out of the 28 distributions; they have approximately the same variability in two cases, and in nine instances are less variable than the girls. Thus, in the majority of the cases for the individual Beta tests, the boys fall below the girls in median performance but are shown to be, on the whole, more variable.

TABLE 7
QUALITATIVE SUMMARY OF THE MEDIAN DIFFERENCES BETWEEN THE BOYS
AND GIRLS OF THE VARIOUS NATIONALITY GROUPS
(Results of boys compared with those of girls.)

Group	Median markedly below	Median moderately below	Median same or only slightly above or below	Median moderately above	Median markedly above
American	B-5	A-1, A-3 A-4, A-5 A-6, A-7 B-3, B-4	A-2, A-8 B-1	B-7	B-2, B-6
Italian		A-1, A-6 A-7, B-1 B-3, B-4 B-5, B-7	A-3, A-4 A-5	A-2, A-8 B-2, B-6	
Portuguese	A-1, A-5 B-1, B-3 B-4	A-3, A-4 A-6, A-7 A-8, B-5	A-2, B-7	B-2, B-6	
Spanish-Mexican	B-3	A-2, A-3 A-4, A-5 A-6, A-7 B-4, B-5 B-7	A-1, A-8 B-1, B-6		B-2

TABLE 8
 QUALITATIVE SUMMARY OF THE DIFFERENCES IN VARIABILITY BETWEEN THE
 BOYS AND GIRLS OF THE VARIOUS NATIONALITY GROUPS
 (Results of boys compared with those of girls.)

Group	Markedly more variable	Moderately more variable	Overlap or slightly more or less variable	Moderately less variable	Markedly less variable
American	A-3	A-1, A-8 B-3, B-6 B-7,	A-2, A-4 A-5, A-6 B-2	A-7, B-1 B-4, B-5	
Italian	A-2	A-1, A-3 A-6, A-8 B-2, B-3 B-6, B-7	A-4, A-5 B-4, B-5	A-7, B-1	
Portuguese	B-2, B-3		A-1, A-6 A-8, B-1 B-5	A-2, B-4 B-6, B-7	A-3, A-4 A-5, A-7
Spanish-Mexican		A-2, B-2 B-3, B-5 B-6, B-7	A-1, A-6 A-8, B-4	A-3, A-5 B-1	A-4, A-7

III. SUMMARY AND CONCLUSIONS

1) *Summary of the Alpha Scale.* We find that in all groups the girls do better than the boys in the median performance. As to variability, in the Portuguese and Spanish-Mexican groups, the girls are more variable than the boys, while, in the American and Italian groups, the boys show themselves more variable than the girls, but this superiority is only slight. We may summarize briefly by stating that, in general, the girls are superior to the boys in average performance in Alpha and more variable in two groups and only slightly less variable in the other two groups.

2) *Summary of the Beta Scale.* For the American and Italian groups, the two sexes practically overlap in performance at the medians, but, in the Spanish-Mexican group, the girls surpass the boys slightly in median performance. In the Portuguese group, the girls rather considerably outdistance the boys. As to dispersion for the three groups, American, Italian, and Spanish-Mexican, the boys proved themselves more variable in this scale than the girls of the same groups. In the Portuguese group, the girls showed themselves more variable although their superiority to the boys of their group was not so marked as it was in the case of the Alpha. In brief, for Beta, the results show the boys in three groups out of four equalling the girls in median performance and excelling them in variability.

3) *Summary of the Alpha and Beta Combined.* In the case of the scale made from combining Alpha and Beta into one battery, the results may be stated as follows. In the American group, the girls exceed the boys in median performance; for the Italian group, the sexes practically duplicate each other in performance. For the other two groups the girls excel the boys in median response; in the case of the Portuguese very markedly so—only 25% of the boys equalling or exceeding the median for the girls in that group. As to differences in dispersion, for the American and Italian groups, the boys are more variable than the girls. For the Spanish-Mexican group, there is practically an overlapping, although the girls slightly exceed the boys. For the Portuguese, again the girls are considerably more variable than the boys of that group.

With the exception of the Portuguese group, then, the boys are, on the whole, more variable than the girls but do not equal them in average performance. With the Portuguese group, there is evidence from the examination of the results that, in view of the

comparatively small number of 12-year-old children involved, the fact of a few very exceptional girl students biased the results for that group unduly toward the female sex. Had the sample been larger, that is, more truly representative, it seems likely that the results would have conformed more closely to those of the other Latin groups.

4) *Summary of Findings from the Study of Individual Tests.* In order to indicate in a somewhat compact form the results from the study of the individual tests of Alpha and Beta, Tables 7 and 8 have been constructed. These give merely a qualitative summary of the principal facts. For actual figures of differences the reader must refer to the proper tables above.

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LES DIFFÉRENCES DE SEXE CHEZ CERTAINS GROUPES D'IMMIGRANTS

(Résumé)

Dans cette étude le problème est l'analyse des différences de sexe comme montrées dans le rendement des élèves américains natifs et de certains groupes d'élèves latins de Californie. Ceux-ci ont été des Italiens méridionaux, des Portugais, et des Mexicains de sang espagnol. On a fait subir les tests collectifs Alpha et Beta de l'Armée à presque 800 élèves âgés de douze ans et pas encore de treize ans. Dans l'Alpha de l'Armée, on trouve que les filles sont toujours supérieures aux garçons dans le rendement médian. Quant à la variabilité, les filles portugaises et espagnoles-mexicaines sont supérieures aux garçons de leurs groupes respectifs, mais le contraire est vrai chez les groupes américain et italien méridional. Dans

le Beta, on trouve que chez les groupes américain et italien les deux sexes ont à peu près le même rendement médian, mais que chez les groupes portugais et espagnol-mexicain, les filles ont un meilleur rendement médian que les garçons, simplement un peu marqué chez le dernier groupe mais très marqué chez le premier. Quant à la variabilité, chez les groupes américain, italien et espagnol-mexicain, les garçons ont été supérieurs aux filles des groupes semblables. Les filles portugaises ont été plus variables que les garçons du groupe. Dans l'Alpha et le Beta, le rendement des filles portugaises est influencé par le fait qu'il y a eu nombre de filles d'une intelligence supérieure. Dans l'échelle faite des tests Alpha et Beta combinés, les filles américaines ont eu un meilleur rendement médian que les garçons américains. Chez les Italiens les sexes sont presque égaux, chez les deux autres groupes les filles ont un meilleur rendement médian que les garçons. Quant à la variabilité, les garçons américains et italiens sont supérieurs aux filles, chez les Espagnols-Mexicains les filles sont un peu meilleures que les garçons, tandis que chez les Portugais les filles sont beaucoup plus variables.

YOUNG

GESCHLECHTSDIFFERENZEN IN GEWISSEN IMMIGRANTENGRUPPEN

(Referat)

Das Problem dieser Arbeit ist die Analyse von Geschlechtsdifferenzen, wie sie sich in der Leistung heimischer amerikanischer und gewisser romanischer Gruppen von Schulkindern Kaliforniens zeigen. Die letzteren waren Süd-Italiener, Portugiesen und Spanisch-Mexikaner. Man hat nahezu 800 Kindern, die zwölf aber noch nicht dreizehn Jahre alt waren, den Armee Alpha und Armee Beta Intelligenz-Gruppentest gegeben. Beim Armee Alphatest zeigt sich, dass die Mädchen bei durchschnittlichen Leistungen überall besser sind als die Knaben. In Bezug auf Variabilität übertreffen portugiesische und spanisch-mexikanische Mädchen die Knaben ihrer Gruppen, aber umgekehrt bei der amerikanischen und süditalienischen Gruppe. Beim Betatest zeigt sich, dass das eine Geschlecht der amerikanischen und italienischen Gruppe die mittleren Leistungen des andern fast wiederholt, aber dass bei der portugiesischen und spanisch-mexikanischen Gruppe die Mädchen den Durchschnitt (median) der Knaben übertreffen, geringfügig bei der letzteren, beträchtlich bei der ersten. In Bezug auf Variabilität zeigen sich die Knaben der amerikanischen, italienischen und spanisch-mexikanischen Gruppe den Mädchen derselben Gruppe überlegen. Die portugiesischen Mädchen waren variabler als die Knaben ihrer Gruppe. In beiden, Alpha und Beta, war die Leistung der portugiesischen Mädchen beeinflusst durch die Natur der Auswahl, die ziemlich klein war. Unter einer kombinierten Skala von Alpha und Betatest übertreffen die amerikanischen Mädchen die amerikanischen Knaben in mittleren Leistungen. Bei den Italienern sind die Geschlechter ungefähr gleich, bei den beiden andern zwei Gruppen übertreffen die Mädchen den Durchschnitt (Median) der Knaben. Bezüglich der Variabilität sind die amerikanischen und italienischen Knaben den Mädchen überlegen; bei den Spanisch-Mexikanern sind die Mädchen ein wenig besser als die Knaben, während bei den Portugiesen die Mädchen beträchtlich variabler sind.

YOUNG

A PSYCHOLOGICAL DESCRIPTION OF LEADERSHIP*

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ROBERT W. NAFE

A lack of adequate leadership for local groups is felt by those engaged in rural social work. To assist in meeting this need the Department of Rural Social Organization of Cornell University is attempting to make a psychological description of leadership. The work is being done in the hope that such a description of leadership, with the addition of those from other points of view, may form a body of knowledge in the light of which leadership may be stimulated and its development guided. Although the work is not sufficiently advanced to draw any very specific conclusions, some general trends may be pointed out.

The terms leader and leadership, like many other terms we have to deal with in the social sciences, antedate the science of psychology. So far as I have been able to find, neither term has any standing in any of the sciences. The literature under "leadership," and similar captions, is legionary, and its variance in point of view is proportionate only to its size. No attempt shall be made here to review it.

The term leadership, in its wider connotation, includes that which comes first in the category of human experience under consideration. This definition, however, offers too broad a field for our immediate consideration.

In one section of this field leadership seems to consist of a state of being first, as found in such cases as the leading brand of soap, leading inventors, leading discoverers, and leaders in scientific thought, etc. These we have grouped together under the caption "static leadership." Into this class fall cases referred to in common usage by such words as "primacy," first in order; "supremacy," first in degree or power; "hegemony," first in interstate power; and "dominance," first in governing power.

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A study of static leadership should yield abundantly toward meeting the popular demand for information on how such individuals achieve their greatness, i.e., the mother's question, "How can I make my boy president?" Many of such cases described in the literature hint at the fact that such leaders seem loath to yield to the demands of society. Most all of them are failures in formal education, and all of them follow with ardor the things which interest them. All refuse to be jammed through the mold of social demand and insist on following their own bents. If the end-product of their waywardness is socially acceptable, the leader becomes famous; if not acceptable, he becomes infamous.

The concept of static leadership, as a state of being first, logically suggests a dichotomy with leadership in action on the other side. This other side may be called "dynamic leadership." Excluding from present consideration "adhesive dynamic leadership," i.e., that part of this field wherein leadership involves direct action through contact, we have left a leadership wherein the leader sets off a force within the led which demands action toward a specific goal, a force which is similar to, although not necessarily identical with, that which actuates the leader toward the same goal. This force accompanies an emotional state, whatever the emotion may be, with all of its actions and tendencies to act. This we call "dynamic infusive leadership," and we may describe it psychologically by observing its actual workings.

For the present our study is confined to leadership and not to leaders. In studying leadership in connection with some specific movement, two kinds of leadership become apparent: one is in response to the force which starts the movement, and the other is that which directs it after it is started. In many instances both functions are filled by one leader and in many cases they are not. The director is, I believe, what Goethe had in mind when he defined the leader as the "König man," i.e., the man who can. The butler's performance in Sir James Barrie's play, "Admirable Crichton" is a good example. Many interesting combinations of instigator and director can be observed.

A further classification shows different types of leaders. Thus we find leaders who impress the group and leaders who express the group. These in turn could be further divided into volunteer, drafted, general, specialized, temporary, permanent, conscious, unconscious,

professional, amateur, personal, impersonal, paid and unpaid, and probably other types.

Perhaps one person, cut to the quick by some situation, will organize a few who are similarly affected in quality, but with only a tendency to act in response to their feelings. By different means this person may heighten the feeling of the group to the point of action and become the leader who expresses that group.¹ The various members of this group in turn may become leaders who impress others. It is only at the point where such leaders begin to express their audience that they are accorded the deference frequently attributed to leaders in general.

The method used by the dynamic infusive leader is to direct and redirect attention to the perceptual and ideational aspect of the situation which produces the affective coloration desired. When this is done, the one so affected becomes, per se, a member of the leader's group. In a similar way one is reclaimed who is slipping from a group. This is done directly or indirectly through the sense departments, appealing, through perceptions and ideas, to emotions for action in response to a command, direction, or guidance.

Just what perceptual and ideational aspects of a situation will move to action or a tendency to action depends upon the individual and upon the system of conduct which determines his affective colorations. An old Greek thinker once said that if all the customs considered moral and sacred were placed in a heap, and all the customs considered impious and immoral were taken from it, we would have nothing left. So we find emotional sets forming from sanctions, prestige, prejudice, and kindred social phenomena.

Rules, forms, institutions, customs, folk-ways, usages, fashions, manners, tastes, morals, laws, and the like work to breed and preserve a pleasant affective state toward some total situation; slogans, watchwords, catchwords, mottoes, war-crys, shibboleths, flags, symbols, etc., help to recall situations and revive their accompanying affective coloration.

Those who attend religious services are moved by certain rituals and rites. The good leader keeps the attention on the services. Sarah Comstock (*Harper's Monthly*, Dec., 1927) describes the method used by Aimee Semple McPherson. She says: "As a director she

¹For this study a group means persons having qualitatively similar affection for (feeling toward) a total situation.

is incomparable. While others are performing, she never for an instant permits interest to flag; at the first sign of restlessness she steps forward. 'All join in with him now! Sail on!' If a young singer's voice proves weak and, therefore, uninspiring, Sister snatches her own tambourine and drives home the rhythm. Let a recitation be dull, she will advance beaming to inquire if it isn't grand. Always she senses, with that swift, uncanny perception of hers, the slightest waning of attention; always, in emergency, she lifts those pink palms, flashes her infectious smile, and breaks into a hymn, catching back her hearers before they discover that they are slipping. This complete control over the mood of her audience she exercises from the instant she arrives upon the platform. Nothing gets away from her. Her grasp, from the first moment, is as tight and as all inclusive as that of a violinist upon his instrument or a chariot racer upon his reins."

Similarly, those set in favor of a strike are kept in that set by their leaders. They keep the strikers en masse as much as possible, during which the aspects of the strike that carry the desired emotional accompaniment are viewed and reviewed with changing garb. The strikers are not permitted to fraternize with the enemy nor to gather in pairs. They are kept away from their homes as much as possible so that they may not view the suffering. In short, they are kept conscious of the favorable aspects and unconscious of the unpleasant aspects of the strike.

Because the pleasant feeling one has for an experience changes to unpleasant when the stimulus is repeated too often, or is continued for too long a time, the leader changes the garb of perceptions and ideas when redirecting attention to them. Good leaders change the program, but work toward one goal.

Certain leaders make an appeal for action through fear. In this group we find the school-ground bully, the officer, boss, manager, and executive. In each instance force can be used. The salesman, orator, teacher, statesman, and those held up as examples because of prestige are leaders who usually appeal to emotions other than fear.

Where the leader makes his appeal through emotions other than fear he finds it necessary to appear to be *en rapport* with the group he wishes to lead. Thus the keeper of the circus elephants, upon catching up with his herd, which had stampeded from fright, first gave the command to charge, the thing which they were doing.

When this was being done in a fairly orderly fashion, he gave the further command to "bull up," or walk on their hind legs with the front feet on the animal ahead. The latter necessitated a slowing up from which it was an easy step to "Halt! About face!" and "Back to the circus parade." Anthony, in his famous speech to the Romans, chose a similar means of appearing to be *en rapport* with the crowd before attempting to make a following out of it.

The attitude of the leader towards the led and towards the project is found to be a problem in name only. The leader needs only to have the appearance of possessing the attitude desired by the following. The real problem, in this connection, is the attitude of the led towards the leader. Similarly it may be observed that the attributes of leadership exist only in the minds of the led. The leader may be this to one and that to another, but it is only by virtue of having a following that he is a leader.

The decline, or causes of failure in a leader, seems to arise either from a failure to arouse an emotion by being unclear, uninteresting, or too far ahead of the led; or by arousing an adverse emotion, by offending, by failing to change the stimulus, or by leaving nothing to the imagination. Knowing the whole truth may hurt prestige, as knowing all the details may hurt a work of art.

So far our description has been purely logical and only for the purpose of this study. The outline is not presented for the purpose of classifying or studying specific leaders, but rather for the study of leadership in connection with some specific movement or organization. A study of any specific leader, from the point of view of psychology, might place him in many different places in the outline, depending upon the specific point in his career referred to. Leadership is a phenomenon which is motivated in different ways, and the occurrence of the circumstances which result in such motivation are not of so simple a nature as to be easily foreseen.

To understand the kind of situations which determine the direction of such activity, and the method used in creating a following, we made a close study of some one hundred cases.

The method used in this study was to visit communities in the state of New York and to get in touch with members of purely local organizations.² We considered it very important to get local

²Local newspaper men and county agricultural and home bureau agents aided greatly in this work.

groups so that we could get the story of the organization from its very inception. With this in mind, the instigator, the one who started the organization or at whose suggestion it was formed, was sought out by the aid of the members and questioned about the origin of the idea or what prompted him into forming the organization. According to our definition, the work of the instigator is a phase of leadership.

When a leader was found he was questioned about the forming and leading of a specific organization or movement, and the questions and answers were recorded. The idea back of the questions was to keep the leader talking about the formation or leading so that motives and methods might be described. This method of study is similar to that used by the psychiatrist. Recalling situations will at the same time recall the accompanying affective states. One can not attend an affective state, but if a total situation is recalled its affective tone will often accompany it, and one may judge from the account given what the affective state is. It seems, from the field work done in connection with this problem, that the urge or drive back of an unpleasant affective state is stronger than that of a pleasant one. It seems, at the same time, more difficult to recall or express the unpleasant situation.

In this way a great deal was learned about leadership in its different phases. From the many cases studied, those cited here were chosen as rather typical of different kinds or as illustrating particular phases.

A request for information about an organization or movement from its parent calls forth a response from a "total set" which is often long and elaborate. It is inadvisable to interfere with this original response. It seems to demand expression, and attempts to thwart it by shifts to another point of view are futile in the face of that demand. Allowing that first response is also advisable because no objection is raised to taking notes on those first rationalizations, and very seldom are objections raised to taking notes when once it is started. When the leader has completely responded to this urge and his thinking is cleared of his old "set," he is able to attend the matter from a new point of view.

The value of the cases studied depends largely upon the credibility of the accounts and observations given. Purported facts seem to shift and vary during the interview, and one must simply judge for

himself, with whatever checks he may acquire, when the truth is approached.

In one small rural community I found a "civics club" recently formed. Upon finding the leader, I asked her to tell me, among other things, about the starting of the club, and why she organized it. To this she replied that in the village there were many things which were every one's business, and yet no one's business; the result was that civic tasks were being slighted. In order to get these tasks done, she had organized the public-spirited citizens and told them of the things she had in mind which needed doing. The group responded readily and did a great deal of public work.

After the woman had exhausted her account of the organization, its formation, and operations, in short, had cleared her mind of her old "set" in regard to the club, I asked her to recall when she first had thought of forming the club. She declared that she had had it in mind for years, but that she couldn't remember when she had first thought of it. When the question was changed to when she had first thought of making some specific step toward the actual formation of the club, she recalled that the minister of her church had issued a call for the women of the congregation to clean the church. She responded to this call and had found, to her consternation, that only one other woman of the congregation had similarly responded. In describing this situation she declared irately: "This made me mad and I decided that the women of this community, and the men too, should do their share of the work." This seemed to be the drive that started the ball rolling.

Anger is, of course, one of the well-known emotions and the resulting action is comprehensible in psychology. Akin to it, if not actually the same, we find cases where the stopping of actions, or plans for action, as was the case with the babies whose behavior was studied by John Watson and with those studied in the Pavlov laboratories, was the forerunner of emotion and its accompanying expression.

An example of this was the forming of a choral society by a Mrs. A who had recently moved into a community. The woman was a trained musician and, in an attempt to establish herself socially in the town, had given a musical recital. This recital was poorly attended and not appreciated by those who did attend. She said that she did not receive applause. This, perhaps, would lend some color

to her original statement that she had started the society to raise the level of musical appreciation in the town. However, she freely added, upon further questioning, that she wished it raised so that she might carry out her original plan of performing before an appreciative audience and receiving applause. This woman's self-expression was stopped and she demanded action.

Another point in the technique of gathering this data here seems pertinent. I was originally informed by the County Agricultural Agent, the Home Bureau Secretary, and the Superintendent of Schools that a Mrs. B was the leader of the local choral society. Although Mrs. B freely admitted that she was the leader and founder of the organization, she recalled that her first steps toward forming the club followed a conversation with Mrs. A. It was through this admission that I was able to find the leader in the case just cited, for, to the public, Mrs. A played a silent and passive part. She said that she had persuaded Mrs. B, who had taught music in the public schools there for years, to start the club because Mrs. B was already well established in the community, both socially and professionally. She was already *en rapport* with the people in the community.

Related cases were found where organizations were formed to preserve some pleasant association. Thus a suffrage club changed to a woman's club after the franchise had been extended to women.

Quite the opposite is sometimes found. In one case a young lady formed a literary and social club to avoid joining another. After much questioning she said, "I didn't want to be in that club, and this one was the kind I wanted to be in, and if I joined this I'd have an excuse for not attending that."

Another typical emotion which seems to give rise to action is fear. The following case is an example:

A minister's wife told about calling into her conference a woman of her husband's congregation who, she said, had some executive ability. By guided conversation and carefully put questions she made this woman think of a plan whereby all of the woman's organizations and societies of the church could be united into one, with committees and subgroups to take up special lines of endeavor. The plan was enthusiastically accepted by the women of that church and by the women of the churches near and far. In answer to the question as to when she first took steps toward starting this consoli-

dation, she said that the Ladies' Aid was about to meet for the purpose of electing officers and that, by inquiry, she had found out that there was no woman in the congregation who would take the presidency. This situation she feared and thought it must be avoided to save her husband's reputation as a pastor and leader of his flock.

Several cases were found which illustrated the method used in creating a following. They all kept the pleasant aspect of the change before the following. As one leader put it, "Yes, we got the thing done all right. I find that if you keep tinkering away on something and keep bringing up the good points of the move and hiding the bad ones that you can always get it across."

Several points of interest may be found in the following case:

Q. Do you remember how it was that you happened to start this literary club?

A. Yes. I had just returned home from a position teaching in college so that I could be with my aged mother. I had been away from home for some time during which I had gone through college and had done a few years' graduate work. Then I taught English in the college of which I spoke. Upon my return I went out quite some socially. I was greatly disappointed in the social conditions I found in my home town, i.e., I found all of the women too interested in other people's affairs—gossip and scandal, and I thought that if this interest could be redirected it would be a good thing for the community. So we started this club.

I think that one of the secrets of the success of our club, which has been running now since 1895, was that we didn't follow the general bent of clubs and waste all of our energies electing officers. We only had a president and a secretary. There is too much energy expended in electing officers. Most clubs spend all of their energy that way. So I thought we should put our first energy and enthusiasm into work. Its longevity is due to me, because I have the character of stick-to-it-iveness.

Q. What method did you use to get members for your club?

A. Well I discussed it with three or four of my friends. Next I invited all of the women that the three or four of us thought would be good members to come to my house at a certain time, but I did not tell the bunch I invited what it was about so that they wouldn't all have crystallized plans about the organization and what it should and shouldn't do. Then when I had them all assembled I just announced that we would have a literary club.

I invited 40 women whom I thought had bright, active minds. One of them was the wife of the local blacksmith. My friends advised me against including her in the group on the grounds that she was not fit, but, just as

I guessed, she turned out to be an excellent worker. She always did her assignment and did it thoroughly.

Q. How many of the women invited to attend that first meeting joined the club?

A. All 40 joined the club. The secretary's books showed an average attendance of about 35. Not all of these did active work. At first I used to go out with the assignments and help train the women to recite. Most of them would refuse to recite on the ground that they couldn't do that sort of thing. They would say that they had never done anything of the sort and were afraid to do it. I would stay with them and help them with their assignments and have them practice when necessary and just make them do their parts. Many of the women I have so trained are now doing active work in other lines.

We had a hard time to get any young folks in the community interested because of an instinctive feeling that they had against running with old folks.

Q. How did you select material for your programs, etc?

A. We belong to the University Extension at Albany and we get 100 books per year for \$5.00. We also belong to the State Federation of Women's Clubs. We joined the University Extension three years after we organized. We assigned different books to the members and had them prepare a paper on their assignment and read it to the club.

This little town is noted and has always been noted for having some very intellectual people, but, as I said, most of them were far too interested in other people's affairs. I remember hearing a conversation on our telephone line, it is a party line, you know. One would say right away that I should not have been listening, but this time it was quite unavoidable. I was holding the line for a long distance call when they did their talking. Anyway one of the women said, "Did you know that the L's have moved into the N's house? The other said, "Oh, no, they haven't. I've been watching the place now right along, and I would have seen them." Answer: "Oh, but they have moved in, I saw them moving the furniture in. It was at ten minutes after two." Reply: "Oh well, come to think of it, I was down at the store at that time so they must have moved in while I was away."

Q. Do you recall when, and under what circumstances, you decided to take definite steps to start this specific club?

A. Yes. I was at that time associating with a very bright woman, but she was altogether too much interested in other people's affairs to the exclusion of other things. She had an idle curiosity. Well, that woman's talk would sometimes exasperate me, and I would frequently have to change the subject, which was very easy to do, as she, like all gossips, are very responsive. It was during one of these times that I thought of a way to give this woman something to talk about.

Q. Have you been the leader of the organization since it started?

A. Yes, I have been president 14 out of 31 times and I have helped out at all other times.

Q. What would you say about the essentials of good leadership?

A. The trick to leadership is to make the lieutenants think they are doing the work.

Q. Just how did you make out your program and follow it in the club?

A. The program is made out by the president. Then the president assigns to each member certain works to be reported on during the season and gives each one a definite date on which she is to report. The members then recite in their turns, and the rest of the club listens to the recitation.

At first, and for that matter during all the time, I have had to go to the individual members and say, "You remember you are to read your paper in four weeks now." The member usually says, "Oh is that so? I had forgotten all about it." Yes I've had to drum them up, as it were. I am not going to do that this year though; I'm going to let some one else drum them up. I'm willing to entertain the children, but not to wash their faces.

Q. Did you take pleasure in reporting to the club when it was your turn?

A. When I was a member I used to take the program home and start to work on my assignments at once. I'd start out by writing the end of every paper. I always write the end of a paper first.

Many clubs have come and gone, but ours pegs on.

Note in this case that the talk of the leader's friend "exasperated" her. Note, also, that this leader was set for leading a literary club as "a strong man to run a race."

Here, as elsewhere, individual differences loom up, and the amount of action coming in response to a stimulus seems dependent upon the emotional set of the observer.

Thus I found a great leader of a young girl's organization, a woman between 60 and 70 years old. She was an only child and lived on a farm without girls to play with. She married and had a family of children, but they were all boys. They are all married now and living away from home. Her home duties are now such that she has spare time which she can spend with girls. This leader seems to have a lot of natural affection for girls, and the fact that it had been starved for so long seems to make it keener now.

I shall quote briefly parts of another case illustrating the importance of set, in which the leader formed a local chapter of the "Daughters of Union Veterans."

Q. How did you happen to be "sold" on the idea of the "Daughters of Union Veterans"?

A. Well, it seemed to me that more attention was being given the new veterans than the old soldiers and that seemed very wrong to me. As a girl, Memorial Day was a big event in my life. I was always in the thickest of where the old soldiers were telling their tales.

Q. Do you remember any specific thing that happened that made you think that too much attention was being given the veterans of the world war?

A. Well, for one thing, the War Risk Insurance is paying so much more than these pitiful little pensions that Civil War vets and their widows are receiving. Another thing that happened was when President Coolidge vetoed the Burson Bill for Civil War veterans. That seemed wrong to me.

Q. You feel very loyal to the Civil War veterans, don't you?

A. Yes. You see my father fought in the War and, as far back as I can remember, I have heard their praises sung here at home. Mother was a very active member of the Woman's Relief Corps and I just grew up in an atmosphere of it."

"Set" seemed very important in the following case wherein the leader formed a community picnic organization. To quote in part:

Q. Do you think possibly that your long illness with its withdrawal from society rather whetted up your appetite for companionship in a crowd?

A. Well, I hadn't thought of that. Maybe it did. So much has happened since that time that I have forgotten.

Q. Did the fact that you had to quit your studies for the ministry grieve you much?

A. Yes, it did. I was very anxious to go on with it. I wanted to be a minister.

Q. Your other training was also along the line of how to handle people in society too, wasn't it?

A. Yes, I had a lot of training along that line.

Q. But the way things turned out you haven't had much chance to use it, have you?

A. No, not very often, but I think I could do that sort of thing.

The following case may be of interest for several reasons. To give a better idea of the field work, I am giving one complete case. It is rather long but typical in showing the relationship between emotion and action.

Q. Can you tell me who formed the City Club here in town?

A. Yes, I did.

Q. Would you mind telling me why you formed it?

A. Well, I came here from Brooklyn two years ago and I had been very active there in public life. Here I found things dull. I saw the need of such an organization as the City Club.

Q. Are there no other such clubs here in town?

A. Oh yes, a great many, but they are not serving enough women. There are the so-called society clubs, but they are exclusive in their membership, and none of them is doing the things I wanted done. Many of them play bridge. Not that I object to bridge, I play it myself now and then, but I wanted to form a literary and art club which would be accessible to more women. The ones here in town don't federate.

Q. Did your club join the federation?

A. Well, we had enough members the first year to join, but so many dropped out at the end of the first year that we haven't enough now.

Q. Why do you think that these members dropped out?

A. Well, they said that the dues were too high.

Q. Do you think that that was the real reason?

A. No, I don't.

Q. You spoke about finding things dull here. Do you recall anything in particular about that?

A. As I said, I came here from Brooklyn. Mother died and I was left absolutely alone and I lived here in this house all alone for some time. I like people my age. I have made many mistakes in life, you might say. Because of my health and all that, my life is about shot. I mulled along here in town and got by after a fashion. Well, after a year or so at it, I felt the need of such an organization. I had to do something—I didn't want to get queer. I had no flare for society such as it is found here, but I did want activity.

I finally called on a friend who once asked me to join the Timely Topics Club and told her that I was ready now to join. My friend told me that I couldn't join then because the membership list was filled up. They were only allowed 16 members. I didn't care. I suppose I was relieved. I then asked her how about all of the other clubs in town, and she told me that they all had closed membership. They all read papers and have a social time.

Then my mind had started along the line and I thought how terrible it was to have the social life of the community so snobbish. I thought of the dear woman who lives upstairs here in the house. She has lived here for years and is now all alone with practically no chance at any social contacts. I told her that this town needs a general club, a cultural club. They have no sense of civic participation in this place. Well Miss A (the lady upstairs) said that she would like to have a literary club. She said, "I'd love to be in a literary club. I've wanted to be in one all of my life, but I was never asked to join one." People here take delight in being exclusive and cold to strangers.

Of the many cultural clubs in this town, and there are a great many, there are only 150 members in all. Out of the 7000 people here in town, only 150 women have any club life. Right here in this house is a dear soul who has worked hard all of her life (she is 74 years old now), who has always wanted some social life, but who has been denied it because no one asked her to join.

My sympathy for the non-privileged class was aroused. As an old suffrage worker, I thought that a civics club where we could inject civic pride and put women on the map would be a good thing. I began talking it up. Everyone with whom I talked said that I couldn't do it. They all said, "Yes, it would be nice, but you can't do it." I called up the aristocrats and asked them if they would join. They all said that they would not, that the town was clubbed to death. I said that it was only for the privileged class. This seemed not to appeal to them.

I called a meeting in April, 1927, and we had six or seven present. I suggested that we meet the next time in some woman's house. The second meeting was called. The woman at whose house we met invited Mrs. Y, a local political boss. She is a very fine woman, but almost entirely deaf. I was sick and couldn't attend the meeting, but I found that Mrs. Y, who had charge of the meeting, didn't get my idea over at all. I wanted to get dues of \$10 voted in so that we could afford to get out-of-town talent. People here are smug with their radios and autos! They are content to let all literary and cultural interest center in the church missionary. They are perfectly smug and content! Most all of them are overworked in home, church, and orphanage. This is a church-ridden locality.

Mrs. Y suggested that we meet at the leading hotel here in town and that representatives of all the cultural clubs in town be invited. When she advanced this notion, they all fell for it. There were 35 or 36 women there, and Mrs. Y ran the whole thing. Those who had agreed on the original idea didn't dare call their souls their own. There is a leadership of aristocracy here. I read in the papers that the women had agreed to have a club for the purpose of study and that there would be a nominal fee of \$1 per year.

This wouldn't work. They can't instruct themselves, and on \$1 per year they can't hire outside instruction. I'd been high-hatted by the privileged group. Mrs. Y was trying to throw a brick at the proletariat. As I said, I was sick and didn't attend the meeting.

I did attend the next meeting and got my \$10 idea across through a resolution to form, with the present founders, a committee which would become a City Club. I felt that I could get by with murder here for the women are not used to organization. I fought like a Bolshevik and kept 18 members at \$10 per year.

Now with the 18 members we tried to extend out and gain influence. I sent the 18 out with blank pledges in an effort to get our membership up to 50. By June 3, 1927, we had 30 signers. I had sent out cards previous to June 3rd to about 50 women inviting them to attend the meeting of June 3rd, but I think only 30 came. We didn't know what to do, but we wanted to arrange it so that the teachers and business women could come in. The teachers and business women of this town are excluded from all other clubs in town because they all meet in the afternoons, so that they couldn't go, even if they could make the social grade.

The women present suggested that we organize anyway even if we didn't have the 50 we had set out to get. So we organized with 22 members instead of 50. Then I found that we had a fight on our hands, as I had antagonized Mrs. Y and her group. It was a case of a leadership by an unknown woman who didn't have any social standing and one who didn't go to church. I am a Unitarian and don't go to church because we do not have any church here.

I used all of my publicity stunts. I'd been a suffrage worker, but independent. I never submitted to leadership. If the leaders suit me, I do what they say, but it isn't often that they suit me.

So then I went to the prominent men here in town who knew the local situation. I got a local board of such men to help out in our organization. That started a whispering campaign against me personally. It was chiefly a case of, "Why did I go to the men?" Well, this town is run by men and with opposition against us already from the privileged class we couldn't win without the help of the men.

I discovered no leaders among my members. My original plans were to start the ball rolling and then find some good local woman to run the organization. I wanted to handle only the publicity end of the club, a thing I'm familiar with. No woman would take the chance on becoming the leader. Social standing here is all linked up with church work, and a paid leader seems to run all of that. There wasn't a recognized leader in our group, and none of the ladies was willing to assume leadership. They had all been victims of leadership here and any leadership in their midst had not grown. At their behest, I went out of our pledge list to get a woman whom they said was a leader to take the presidency. But efforts along this line failed, because every woman in town capable of taking the office refused on the ground that the town was clubbed to death. I tried to show them that it was clubbed to death only in the privileged class, but I didn't seem able to convince them, and none would take the place.

This made me so mad that I decided that I would see the thing through myself. I went to see Dr. G. (a local clergyman) and told him that it looked as though I'd have to be president myself. I told him the difficulties, i.e., that I have no husband, no family, no social standing, no church affiliations, nothing. Yet he said for me to go ahead.

You see, I'm not a leader. I am an organizer, but here I had to be the leader. There was no leader in the group developed. I realized all last year that it was a serious handicap to have me as president. However, it did have its advantages, too. They centered their attack on me and had, in the last analysis, to attack me personally, and I didn't care a hang because they couldn't get back at me. I wasn't striving toward anything socially or any other way, and they couldn't reach me. In a measure that saved the club from the attack.

I tried to develop a leader out of our group to take the presidency for

the second year. I think that I have one; but its a crucial year, and she can't win unless I stand right back of her and see the thing through myself. There was no initiative shown except by the chairman of the Entertainment Committee.

I felt a growing resentment; although none of the men showed it, there was a growing resentment against my dictatorship. I felt that this was because I didn't fit in with the requirements of leadership which were local. At that point, one of the local social leaders came into the club who had sufficient prestige to be president. We went to her and asked her to take the leadership, but she wouldn't do it. We then went to another local leader and asked her to take the post, but she wouldn't do it. She wouldn't assume the obligations, but she said that she would back me up in the office. She is the type who could succeed. I hope that she'll take the office, but she says that she won't. Maybe we can persuade her yet. I feel that the work of organization is not over.

Well, then, I said to this small group who were loyal to me, but discouraged because of a lack of public response, "Well, there's no one to go ahead except me, and I will not go ahead unless we can get some other woman to take the leadership." I asked these women to get some local leader. They didn't do that, so then I got out this letter to go out under the name of our treasurer. It brought us in five new members, and some of them rank high enough socially here in town to give a sponsorship.

Then I myself—I felt that Mrs. Y was my meat—I went after her and told her I needed her. I'd gone as far as I could. I told her that I realized that it hadn't suited her, but I explained my reasons. Mrs. Y showed that she was a good sport and came in. She is a Christian Scientist and a bit of an idealist. Her son has been sick for a year and a half. They call it nervous trouble, but he is insane. Barring that great grief and her handicap, i.e., her deafness, she would take over the leadership.

I could succeed with success, but I don't want any prestige in this town. It would only be a matter of bridge and a social time and having a lot of women talk over my linen after they had left my house. I wanted to build up prestige for the club. The women here are not used to that, they are only used to personal prestige.

Our club had a reception to the mayor and one to his successor. I had one of the local bankers talk to us. I just bluffed it through and made the club felt. I thought that it would be like the women in New York; that is, when they felt their importance that they would rise to the occasion, but they haven't.

Then there was an attack on me by a teacher here. She left the club and took six teachers with her. That left us only four.

All of my problems were entirely personal up to the time that I took up an interest in the suffrage movement, although I was more or less interested in it since I was a little girl. My life up to that time was a life of personal struggle.

Q. Was your life unpleasant?

A. No, not all unpleasant, because it had some compensations. I was striving for some compensatory thing. It is all very complicated. My husband died four years after we were married. I had to be a wage-earner from that time on because my father and mother needed help. I had always tried to do something in the humanitarian field. Father was an invalid for 18 years. I did not get my humanitarian streak from any of my ancestors. My life was a sheltered one in many respects, and then suddenly I was thrust into the wage-earner class. There was no middle, or transition, period. I was thrust from one extreme to another. My suffrage work was my first activity in any public cause. Here I found my own field through newspaper publicity because I could and did do this on my own hook.

Then I found that everything that I've done has been motivated by anger—by anger at the opposition. I went into woman's politics because I was angered at men. The opposition was so extreme that I wouldn't give up. My fighting spirit was aroused and I wouldn't give up.

My first job was in a law office. Then I worked for the First National Bank. Then father had a paralytic stroke. The reason that I had wanted to work before that was that I couldn't get through high school. I just couldn't get algebra. I failed it the second time and just gave up.

I'll be 50 years old in February, and I was 17 then, but the avenues of business, etc., were not open to women then. I wanted to be a school teacher, but I couldn't do that because I didn't have the work. I would love to teach. The moment I get anything I want to impart it.

My husband was a lawyer and he met a sudden death at the age of 31.

From the bank I went to work for the Eastman Kodak Co., for a few months. While working there, I took the civil service examination, just to keep a girl friend company. I passed that all right, and stood 11th on the list. They appointed me to a position in the excise department. I didn't like the place, but they kept raising my salary and I had to earn money, so I stayed there. If I had had a different education, I would early have expressed myself in public affairs, but I couldn't as I didn't have the proper background.

After my husband's death I took up law. I didn't like it as I thought I would, and I took up journalism at New York University. I utilized it only in connection with the suffrage work of which I told you. I wasn't strong enough physically to make good on a newspaper job. I only did things when I got excited over some cause; only when I got indignant, then I'd fall back on my shoe-string of petit talents and work things out my own way.

I'll say this for myself, I'd knuckle under discipline if I had had physical endurance, but all of my work has been done by fits and starts. My physical stamina was not great enough to make me a dependable servant. I would have knuckled under if I could have served ably and continuously.

Q. How do you account for this weakened physical condition?

A. Why—just inherited it. My family was weak on both sides. I was always under a great emotional stress and link that with a highly emotional nature; and see what happens; just at the time I'd be getting some place I'd have an upset, intestinal trouble, or something else, a sick headache. I think I would have been all right physically if I hadn't been under a strong emotional stress from the first. I had no playmates; I was an only child and don't to this day know what or how people think. I didn't have any early training in give and take.

Of course, I have great faults. I can't submit to discipline. This, I think, is an inherited trait. Then if I try to overcome this I have great trouble making the physical grade. When one submits to discipline he must keep going; he must be on the job. With me it is not so much a case of unwillingness, but physical unfitness.

We hope in a later work to observe and study, in a similar way, the "leader-led" relationships. This would include the attributes of leadership, methods of leadership, and its decline or causes of failure. The richness of the material gathered tempts one into pointing out many things of interest and even into concluding from them, but, for expediency, only those pertinent to leadership are here considered.

No attempt shall be made here to reach any specific conclusions, but thought seems to become effective, as active leadership, only through the arousal of an emotional state, and the arousal of this emotional state seems to depend upon the affective coloration accompanying aspects of the situation and one's prior emotional set.

That thought changes into action by way of emotions has its implications. W. B. Cannon has shown the characteristic physiological state of emotion, and the same state was found for each emotion studied. If, with all emotions, we find this set for action, might we not look for the reverse, i.e., look for emotion where we find action? In this psychological study of leadership we have found evidence of this.

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UNE DESCRIPTION PSYCHOLOGIQUE DE LA CAPACITÉ DE DIRIGER

(Résumé)

On nous donne une description de la capacité de diriger et une classification du sujet selon le type de cette capacité. On étudie cette capacité sous le nom de "Dynamic Infusive Leadership." On définit celle-ci comme la capacité de diriger quand la personne qui dirige met en action une force

chez les dirigés laquelle exige l'action vers un but spécifique, force semblable, bien qu'elle ne soit pas nécessairement la même, à celle qui pousse la personne qui dirige vers le même but. Cette force accompagne un état émotif, quelle que soit l'émotion, avec toutes ses actions et ses tendances à agir. On décrit les types, les attributs, et les méthodes employées dans cette "dynamic infusive leadership," et on considère les attitudes de la personne qui dirige vers les dirigés et vers le projet. De même on considère le déclin de cette capacité de diriger et les causes de son affaiblissement. Sur cent cas de cette capacité observés et étudiés, on en donne quelques-uns entiers ou en partie pour illustrer les principes engagés. On décrit la méthode employée pour trouver les données et la technique de les rassembler. Bien qu'on ait rassemblé la plupart des données employées au moyen d'interviewer les personnes qui dirigent, c'est une étude des principes de cette capacité plutôt qu'une description des personnes qui la possèdent. On donne quelques conclusions et un résumé des autres études nécessaires.

NAFE

EINE PSYCHOLOGISCHE BESCHREIBUNG VON FÜHRERSCHAFT

(Referat)

Es handelt sich um eine Definition von Führerschaft und eine logische Klassifikation des Gegenstandes in verschiedene Arten von Führerschaft. Man wählte dynamische, einflössende (infusive) Führerschaft zum Studium. Diese wird definiert als Führerschaft, unter welcher der Führer im Geführten eine Kraft hervorruft, die eine Wirkung gegen ein spezifisches Ziel gebietet und ähnlich, obschon nicht notwendigerweise identisch ist mit der, die den Führer gegen dasselbe Ziel antreibt. Diese Kraft begleitet einen Gefühlszustand,—welcher Art das Gefühl auch sein mag,—mit allen dessen Wirkungen und Streben zu handeln. Typen, Attribute und Methoden, die die dynamische, infusive Führerschaft gebraucht, werden beschrieben, und das Verhalten des Führers gegen den Geführten und das Projekt werden in Betracht gezogen. Ebenso der Niedergang der Führerschaft und die Ursachen des Versagens. Von den hundert beobachteten und untersuchten Fällen von Führerschaft sind einige ganz oder zum Teil wiedergegeben, um die eibezogenen Prinzipien zu illustrieren. Die zur Bestimmung des Materials angewandte Methode und die Technik des Sammelns werden beschrieben. Obschon die meisten Daten durch Interviews mit Führern gesammelt wurden, ist die Untersuchung eher ein Studium der Prinzipien der Führerschaft, als eine Beschreibung von Führern. Es werden ein paar Schlussfolgerungen gezogen und der Verlauf weiterer Studien entworfen.

NAFE

II. A QUANTITATIVE COMPARISON OF CERTAIN MENTAL TRAITS OF NEGRO AND WHITE COLLEGE STUDENTS*

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Current opinion tends to regard the American Negro as a distinct type and to assume that he has definite social, physical, and mental traits different from those of the white man. Such possible racial dissimilarities in specific mental traits have received some attention in scientific literature, the range and nature of which may be observed from the summary given in Table 1. Racial traits are popularly conceived to be obvious, consistent, and habitual behavior patterns or physical peculiarities that are characteristic of particular groups. Usually these observed types are more or less extreme categories into which it is difficult to fit all members of a group. For example, it is hard to fit all men of any racial group into categories of tall and of short men. In fact, variations in the measurement of a single trait center around the average, about which there is ordinarily a considerable spread. The nature of this variation about a central tendency is the "normal" or "Gaussian" type of distribution. There is, also, marked difference in the absolute extent to which distributions vary about their average values. Hence, one must include a measure of variability as well as averages, for, where traits have a high variability, they will possess little social value unless their central tendencies are very widely separated. Most of the investigations reported fail to include both of these measures and do not determine the reliability of their differences. Also, most studies of traits lie in the margin of a main problem and are often based on actual observation of too few cases, which may be rather extreme. In consequence, peculiarities of eccentric individuals within the less known race may be considered outstanding racial traits.

This present discussion, based upon a study of negro and white

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TABLE 1

TRAIT DIFFERENCES BETWEEN NEGROES AND WHITES IN MENTAL RESPONSES
(Results are stated in terms of the relation of the typical negro response to the typical white response.)

Trait observed	Result	Specific test, investigator or reporter, and date
Speed	slower	In general: ² Phillips (52) 1914; Peterson (48) 1923; McFadden and Dashiell (40) 1923 In maze, but more accurate: Ferguson (14) 1916 In speed tests: Sunne (67) 1925 In learning: Garth (22) 1926 In miscellaneous tests: Peterson, Lanier, and Walker (51) 1925; Peterson and Lanier* (a difference of 1.6 Q_w for age 10, of .05 Q_w for age 12, of 1.99 Q_w for southern and 1.42 Q_w for northern negroes)
	approximately equal or excelling	In reaction time: Bache (3) 1895 In motor tests: Pyle (58) 1915 In cancellation, but less accurate: Ferguson (14) 1916; Derrick (12) 1920 In decisions: McFadden and Dashiell (40) 1923
	less accurate	Baldwin (6) 1913; Trabue (69) 1919; Garth (22) 1926; Yerkes (76) 1921; Peterson (48) 1923; Sunne (67) 1925
Accuracy	equally or more accurate	In maze, but slower: Ferguson (14) 1916 In fatigue tests: Garth (18, 19) 1920, 1921
	inferior	Morse (43) 1914; Pressey and Teter (57) 1919; Derrick (12) 1920; Schwegler and Winn (61) 1920; Ferguson (16) 1921; Yerkes (76) 1921; Peterson (48) 1923; Whitney (72) 1923
Reasoning, including abstract thinking, logical analysis, and mental construction	no difference	Sunne (64) 1917

*See (2) in reference list of this paper.

²The reader is referred to the previous article (1) for information regarding the subjects, for a discussion of the tests and their administration, and for the bibliography to which the citations refer.

TABLE 1 (*cont.*)

Trait observed	Result	Specific test, investigator or reporter, and date
Memory, especially rote	inferior	Pyle (58) 1915; Sunne (64) 1917
	no difference or superior	Morse (43) 1914; Phillips (52) 1914; Pressey and Teter (57) 1919; Derrick (12) 1920; Murdock (44) 1920; Schwegler and Winn (61) 1920; Ferguson (16) 1921; Peterson, Lanier, and Walker (51) 1925
Judgment	poorer	Phillips (52) 1914; Yerkes (76) 1921
Analysis of practical situations	equal	Sunne (66) 1925
Imaginativeness	more fertile	Sunne (64) 1917; Sunne (66) 1925
	inferior in mental imagery	Schwegler and Winn (61) 1920
Inhibition	superior	Crane (11) 1923
Volitional perseveration	less	McFadden and Dashiell (40) 1923
Industry	less	Whitney (72) 1923 (15 to 25% less difference in achievement than in intelligence)
Information acquired chiefly through reading	inferior	Sunne (66) 1925
	superior	Yerkes (76) 1921 (when paired for intelligence, the negroes' performance was 114% of the whites in Alpha Test VIII)
Social situations	superior	In ease of bearing and freedom from tension: Peterson (48) 1923 In easy communicativeness: Garth (22) 1926 In social participation: Lehman and Witty (37) 1926 (61 to 68% surpass the white median)
Strength of personality	inferior	In Downey Will-Temperament Test: McFadden and Dashiell (40) 1923 (15% of the negroes exceed the white median)

TABLE 1 (cont.)

Trait observed	Result	Specific test, investigator or reporter, and date
<i>Evaluation of the Test Results of the Present Study</i>		
Speed	inferior in Otis, Rational learning, and Atkinson	The median of these three tests represents a negro median deficiency of .68 Q_w .
Accuracy	inferior in Hard Opposites, Myers, and Atkinson	Reliable differences are obtained only from percentages of response.
Persistence	inferior in Otis, Alpha, and Myers	The single measure in the Otis test represents a negro median deficiency of .73 Q_w .
Memory	superior, based upon an analysis of elements of Atkinson and Rational Learning tests	The white median deficiency in one element of the Atkinson test is .55 Q_w . (But neither test measures sheer retentiveness.)

college students, attempts to analyze various tests and compare the two groups in certain specific mental traits. It is the second article; a previous one dealing with the relative abilities of the two groups as shown in their rational responses has been published recently (1).¹

The tests from which this section of the data is obtained are the following: Rational Learning (46, 50), Otis Self-Administering Tests of Mental Ability, the Atkinson Test, Mean's Hard Opposite Test (41), Myers Mental Measure (45), the Kent-Rosanoff Free Association Test (34), and the Army Alpha (78).

The Rational Learning is an individual test which is considered especially good for race comparisons and for quantitative analysis of certain traits. The data are presented in three tables, the first, Table 2, showing median differences for the two races in the various elements analyzed, the second, Table 3, giving the percentiles for the classes of error, and the third, Table 4, picturing the average learning progress for each race in each fifth of the required repetitions. A study of these tables leads to a few general conclusions. The first is that the negro group is slower in learning time, as evidenced by the differential critical ratio of 4.0. The extent of this difference

¹See (1) in reference list of this paper.

amounts to .68 Q units of the white distribution. In spite of the fact that three different persons, whose reaction times must be included, gave the tests, this difference probably has considerable significance. In the second place, the test fails to show any significant difference between the races in the analysis of the various fifths of the learning process. Although it is true that the coefficients of variability for the absolute scores show that the negro is somewhat less variable in the first two-fifths of the learning process and more variable in the last two, yet even this does not hold for the percentage of the errors in the second and final fifths. The tables also show that the negro group seems less able to give attention to all the required elements of the complex situation than does the white group. In the logical errors, a difference of .57 Q_w , favoring the whites with a critical ratio of 3.0, is somewhat significant, though not reliable. In the perseverative errors, the critical ratio of 5.5 shows in favor of the whites a reliable difference which amounts to .92 Q units of the white distribution. Though in the separate fifths of the learning the variability is so great that reliable differences are not obtainable, the median white is able to organize the work so that he makes fewer of the logical type of mistakes and fewer of the perseverative throughout all the fifths of the learning process. Hamilton's study (28) favors the theory that a greater number of perseverative responses is indicative of an inherently lower reacting organism. In the complex test situation, this relatively poorer elimination by the negroes of both perseverative and logical errors might be similarly explained. However, there is another possible explanation. The cause of the increased number of logical and perseverative errors may lie in a somewhat different method of attacking the problem. Certain facts seem to justify an inference that the negroes, more than the whites, regarded the test mainly as an exercise of memory and, therefore, as a simpler problem. Naturally, if this is true, they would adjust less adequately to the several elements of the complex situation and would be poorer in avoiding logical and perseverative responses, while they might obtain some advantage in reducing errors most readily eliminated by memory. In support of this, the following points are noted. When the median combined scores are compared, the difference revealed is not statistically reliable. Also, in determining the total errors, the scoring method rewards the subject who attacks the problem logically and may obscure the retentiveness of the one who attacks it as a memory ex-

ercise. An error is scored as two errors if logical or perseverative and as three errors if both logical and perseverative. If errors had not been so weighted, it could be seen that the median negro actually makes fewer wrong responses than the median white and fewer errors that are neither logical nor perseverative. In addition, some introspective reports and observations were made at the con-

TABLE 2

A MEDIAN COMPARISON OF WHITE AND NEGRO RATIONAL LEARNING RESPONSES*

	Race	Median	<i>Q</i>	Diff. in medians	$\frac{\text{Diff.}}{P.E.}$ <i>diff.</i>	$\frac{\text{Diff.}}{Q_w}$	Lap. Diff. Md. favors
Time	W	18.7	5.6	3.8	4.0	.68	71 W
	N	22.5	5.3				
Repetitions	W	12.9	3.4	1.3	1.7	.38	60 W
	N	14.2	3.4				
Total errors	W	224.0	125.0	46.0	2.1	.37	60 W
	N	270.0	121.0				
Unclassified errors	W	158.0	79.5	13.0	1.0	.16	58 W
	N	171.0	68.0				
Logical errors	W	54.0	37.0	21.0	3.0	.57	66 W
	N	75.0	41.0				
Perseverative errors	W	9.2	8.7	8.0	5.5	.92	66 W
	N	17.2	7.7				

The key to the symbols used in this table is as follows: W means the white and N the negro race; *Q* is the quartile deviation, or one-half of the distance between the 75th and 25th percentile points in the given

distribution; $\frac{\text{Diff.}}{P.E.}$ is derived from the following formulae: $P.E._{md} =$

$5/4 \cdot \frac{Q}{\sqrt{N}}$, and $P.E. = \sqrt{P.E._{md_1}^2 + P.E._{md_2}^2}$, and gives a critical ratio

which, if the quotient is as high as 4, shows the reliability of the difference obtained; $\frac{\text{Diff.}}{Q_w}$ gives the difference between the medians divided by the

quartile deviation of the white group and makes inter-test comparison possible independently of the size of score units; *Lap. Md.* means the percentage of one group surpassing the median of the other group; *Diff. favors* means that the difference is favorable to the group indicated.

The above measures include 100 subjects in each case. The quotients indicate true differences between the groups only in time and in perseverative errors.

*The statistical computations were calculated to the nearest hundredth, but are recorded here only to the nearest tenth. This procedure has been regularly followed in all tables of this article.

TABLE 3

A PERCENTILE COMPARISON OF WHITE AND NEGRO RATIONAL LEARNING RESPONSES

Percentiles	Logical errors*		Perseverative errors†		Unclassified errors‡	
	White	Negro	White	Negro	White	Negro
100	2	0	0.0	0.0	29	32
95	6	17	0.0	1.5	47	62
90	16	21	0.0	2.7	57	73
80	24	28	1.4	5.7	85	100
75	30	32	2.3	8.4	98	111
70	33	35	3.5	9.4	104	115
60	44	60	7.5	13.5	132	142
50	54	75	9.2	17.2	158	171
40	61	85	11.2	20.3	185	210
30	92	104	17.3	22.1	222	235
25	104	114	19.7	23.7	257	247
20	114	134	23.7	26.7	297	269
10	155	158	31.5	40.0	373	341
5	205	199	47.0	48.0	448	422
0	338	548	82.0	68.0	788	1208

*A logical error is a repetition of a number already indicated in the same trial to be right for a previous letter. It is illogical to give for any letter a number which has recently been identified with a previous letter.

†A perseverative error is a repetition of a mistake previously made in the same trial for the same letter. To make this error, the subject persists in giving a response which he recently has observed to be wrong.

‡An unclassified error is any wrong response of any kind.

clusion of the test. These suggest, even though they do not prove, that the negroes' methods, where they showed plan in their procedure, employed memory aids such as grouping, mnemonic, or associative schemes rather than methods of organizing the problem on a logical basis. Though the question may still be raised as to whether this method of attack may not be due to an inherently poorer reacting mechanism, it is much simpler and more plausible to suppose that the dependence upon memory instead of logical organization is due to different environmental influences. Negro education still tends to emphasize methods discarded by the more efficient white colleges, such as memorizing outlines of subject-matter and verbal symbols necessary to express desired relationships or solutions; while white education tends more to demand and check logical inferences from observable relationships.

The Otis Self-Administering Tests of Mental Ability are analyzed in Table 5, which examines the number of rights, wrongs, omitted,

TABLE 4
PROGRESS IN THE RATIONAL LEARNING TEST ANALYZED BY FIFTHS

Errors	Race	First fifth Mean	First fifth σ	First fifth V^*	Second fifth Mean	Second fifth σ	Second fifth V	Third fifth Mean	Third fifth σ	Third fifth V	Fourth fifth Mean	Fourth fifth σ	Fourth fifth V	Fifth fifth Mean	Fifth fifth σ	Fifth fifth V
Part I: Based on a distribution of scores in various classes of errors																
Unclassified	W	82.4	53.0	64	58.7	51.5	88	34.5	37.4	108	14.9	16.0	107	6.1	5.5	90
	N	37.7	51.0	58	58.2	44.5	77	37.9	37.8	99	12.0	18.0	150	7.5	7.4	98
Logical	W	30.5	23.6	78	23.6	22.5	95	14.2	15.6	111	5.9	7.1	119	1.8	2.1	119
	N	35.9	23.7	66	24.1	22.6	94	15.9	17.8	112	8.2	14.4	175	3.8	7.5	196
Perseverative	W	4.9	6.1	123	4.5	6.0	133	2.8	3.8	136	1.3	1.6	122	.7	.7	100
	N	7.2	7.6	106	5.0	5.4	107	3.1	4.0	130	2.3	3.3	144	.9	1.6	170
Part II: Based on a distribution of percentage of errors																
Unclassified	W	33.8	11.1	33	20.3	5.4	26	11.6	5.3	45	5.2	3.6	70	2.7	2.5	94
	N	32.3	9.9	31	19.2	5.9	31	11.2	5.5	49	6.1	4.7	78	3.0	2.5	84
Logical	W	10.9	5.3	48	8.0	3.6	45	4.6	2.7	60	1.8	1.5	86	.4	1.6	380
	N	11.8	3.8	32	7.7	3.8	49	4.3	2.6	61	2.2	2.2	100	1.1	1.2	106
Perseverative	W	1.7	1.9	113	1.5	1.7	114	.9	1.1	114	.5	.6	133	.3	.5	135
	N	2.8	2.7	94	1.7	1.8	109	1.0	1.2	119	.7	1.1	152	.4	.8	181

*The coefficients of variability were derived from the formula $\frac{\sigma}{M} \cdot 100$. The scatter is so wide within each fifth that these are very high.

†Each subject's record was divided into five equal parts based upon the number of repetitions required, the last two correct repetitions being excluded.

TABLE 5
A COMPARATIVE ANALYSIS OF OTIS RESPONSES

	Race	Median	Q	Diff. in medians	Diff. P.E. diff.	Diff. Q _w	Lap. Md.	Diff. favors
Number	W	7.9	3.1	.7	1.6	.21	57	W
wrongs	N	8.6	3.1				46	
Percentage	W	14.8	6.4	1.6	1.7	.24	57	W
wrongs	N	16.4	5.8				44	
Number	W	1.7	1.7	1.3	4.0	.73	70	W
omissions	N	3.0	2.6				34	
Percentage	W	3.3	2.9	2.1	3.9	.73	72	W
omissions	N	5.4	4.7				34	
Number	W	53.3	5.8	3.3	3.7	.58	66	W
attempted	N	50.0	6.7				34	

The percentage medians were obtained from frequency distributions in which the scores represented the number of wrongs or omitted divided by the number of the highest problems worked, it being assumed that the student had at least read all the earlier ones. The quotients for the two differential critical ratios in omissions indicate that the whites excel in persistence. The ratio 3.7 for the attempted is indicative of advantage to the whites in time.

Of the subjects included in this study, 126 were white and 181 colored.

and attempted. Certain general conclusions are apparent. In the first place, the negroes more readily give up a problem than do the whites: The critical ratios for omissions indicate a reliable difference between the two groups in persistence. Then, the negroes are slower, the difference in this respect approaching reliability. In accuracy, there is a slight but statistically unreliable advantage to the whites.

The Atkinson Ingenuity Test considers for analysis factors of accuracy (the right and wrongs), of speed (the number attempted), and of retentiveness and observation (the so-called errors of repetition in which merely a different arrangement of the letters is given). In regard to the first point, the whites, with fewer wrong responses, were more accurate. While this difference is not reliable, the differential critical ratio, 3.3 for the percentages, approaches reliability. As a corollary, the whites had in the number of right responses a difference, though not a reliable one, in their favor. Then, with time held constant, the negroes attempted less, and hence may be considered slower. The statistical treatment indicates a reliable difference on this point, though not one which applies to the upper limits of the two groups, since 30% of the negroes and

50% of the whites recorded the maximum number of right responses and cannot, therefore, be differentiated. In the third factor of observation and retentiveness, the negroes excel the whites with fewer errors of repetition, that is, repeating a combination but in some other one of its 24 possible arrangements. Thus, *OBHI* might be correctly recorded as one possible combination and later repeated in another arrangement as *IBOH*. It is apparent that considerable ability is required to avoid such duplication. Greater success probably means either that the work was done more systematically and therefore errors could be better eliminated or that this detail was more carefully observed, or that the earlier combinations used were better retained.

The Hard Opposite Test, analyzed in Table 7, compares the two groups in exactness of definition and in knowledge of verbal mean-

TABLE 6
A COMPARATIVE ANALYSIS OF ATKINSON RESPONSES

	Race	Median	<i>Q</i>	Diff. in medians	$\frac{\text{Diff.}}{\text{P.E.}}$ <i>diff.</i>	$\frac{\text{Diff.}}{Q_w}$	Lap. Md.	Diff. favors
Number rights	W	12.8	3.9	2.0	3.1	.51	62	W
	N	10.8	3.4				33	
Percentage rights	W	55.5	19.0	2.7	.9	.14	53	W
	N	52.8	16.8				45	
Number wrongs	W	6.7	4.8	.6	.8	.13	47	W
	N	7.3	3.9				57	
Percentage wrongs	W	27.5	23.6	12.5	3.3	.53	38	W
	N	40.0	19.4				69	
Number repetitions	W	2.6	1.5	.8	3.5	.55	35	N
	N	1.8	1.2				66	
Percentage repetitions	W	9.7	8.1	2.2	1.8	.27	42	N
	N	7.5	5.0				62	
Number attempted	W	24.0	2.1	1.9	4.2	.90	61	W
	N	22.1	2.9				36	
Percentage of total attempted	W	100.0	10.2	8.7	4.5	.85	64	W
	N	91.3	11.9				37	

The percentages were obtained from frequency distributions in which scores represent the number of rights, wrongs, or repetitions divided by the total number of answers recorded whether right or wrong. For the attempted, the scores were obtained by dividing the number actually recorded by the number of possible correct answers, i.e., 24. A differential critical ratio of over four in the two measures for attempted indicates a speed difference in favor of the whites. In the case of one measure for repetitions, the difference approaches reliability and favors the negroes.

The above measures include 100 subjects in each race.

TABLE 7
A COMPARATIVE ANALYSIS OF HARD OPPOSITE RESPONSES

	Race	Mean	$\sigma_{dist.}$	Diff. in means	$\frac{Diff.}{\sigma_{diff.}}$	$\frac{Diff.}{\sigma_W}$	Diff. favors
Score	W	109.6	42.5	3.0	.5	.07	W
	N	106.6	54.2				
Rights	W	29.1	7.9	1.0	1.1	.13	W
	N	28.1	9.3				
The half-rights	W	3.3	1.9	.6	2.4	.30	W
	N	3.9	2.0				
Rights	W	91.6	5.7	1.9	2.8	.34	W
Half-rights	N	89.7	6.2				

The above measures include 187 negro and 274 white subjects.

ings. This is shown by the scores, by the number of rights or half rights, and by the percentage obtained from dividing the number of rights by the rights plus the half rights. This section suggests that the white group possesses a finer sense of verbal discrimination and a more exact understanding of the use of words. The quotient of 2.8 for the rights divided by the rights plus the half rights suggests that the white students are more completely correct.

The Myers Mental Measure is examined for accuracy, speed, and persistence in the several different types of responses required. The only reliable superiority is that of the whites in accuracy, noted (for the percentage of wrongs) in three of the four tests. This amounts to 1.20 Q_w , if the median of the three reliable measures is representative of the amount of this difference. In speed, the tests show no significant difference except in Test 2 (Completion), where the white group is more rapid. For the third factor, persistence, the slight and, except in one measure, unreliable advantage of the whites in fewer omissions reveals no great difference.

In the *Free Association Test*, the percentage of most common responses² and the speed of response were analyzed. The difference was seen in both cases to be unreliable. No evidence, therefore, is revealed by this test to prove that the typical negro college stu-

²The 500 "most common responses" out of a thousand were obtained from the Kent-Rosanoff tables (34) by arranging the responses in a rank order with the most frequent at the top and then by counting down the list until a total of 500 was obtained.

TABLE 8
A COMPARATIVE ANALYSIS OF MYERS RESPONSES

Test	Items	Race	Median	<i>Q</i>	Diff. in medians	$\frac{\text{Diff.}}{\text{P.E.}}$ <i>diff.</i>	$\frac{\text{Diff.}}{Q_W}$	Lap. Md.	Diff. favors
I	Number	W	4.4	.9	.3	.2	.34	57	W
	wrongs	N	4.7	.8				38	
	Percentage	W	36.2	7.9	2.7	2.4	.34	52	W
	wrongs	N	38.9	6.8				41	
II	Number	W	1.2	.8	1.0	.7	1.15	74	W
	wrongs	N	2.2	1.0				25	
	Percentage	W	6.7	6.7	8.0	7.2	1.20	76	W
	wrongs	N	14.7	7.8				23	
	Number	W	1.5	1.1	0.0	0.0	.01	50	W
	omissions	N	1.5	.9				50	
	Percentage	W	7.5	8.4	.4	.3	.05	52	W
	omissions	N	7.9	7.4				47	
III	Number	W	1.4	.5	.6	.7	1.28	80	W
	wrongs	N	2.0	.8				27	
	Percentage	W	10.8	5.5	9.7	11.0	1.76	82	W
	wrongs	N	20.5	6.0				27	
	Number	W	.8	.5	.1	0.0	.13	46	N
	omissions	N	.7	.4				54	
	Percentage	W	<i>Q</i> equals zero for both races						
	omissions	N							
IV	Number	W	4.2	1.4	.9	3.9	.69	68	W
	wrongs	N	5.1	1.9				35	
	Percentage	W	26.5	7.2	5.9	3.9	.81	67	W
	wrongs	N	32.4	12.6				36	
	Number	W	.9	.7	.1	0.0	.15	50	W
	omissions	N	1.0	.7				49	
	Percentage	W	1.8	3.4	.2	4.3	.06	56	W
	omissions	N	2.0	3.5				44	

The percentage medians were obtained from frequency distributions in which the scores represented the number of wrongs, or omitted, divided by the number of the highest problem attempted whether completed or not. When we observe the size of *Q* in relation to the median, it is apparent that these data are largely unreliable statistically. The data for the number attempted are omitted because nearly all completed the whole task, except in Test II, and in that test the whites attempted more problems. The difference here was reliable as indicated by a critical ratio of 5.8. The medians are 14.1 and 13.1, respectively, and the negro deficiency amounts to .94 Q_W . In Test I none of the whites and only 2.3% of the negroes omitted a single problem. Reliable differences are to be noted for the percentage of wrongs in Tests II, III, IV, and for omissions in Test IV.

The above measures include 168 negro and 106 white subjects.

dent is less normal in his associative responses than is the white student. The median negro student included over 49% of the most common responses of the Rosanoff adult sampling, and the median white included over 54% of these responses which are supposedly the dominant associational patterns of the average citizen. This unreliable difference suggests a common associational background for both racial groups and, therefore, a common cultural and environmental background. Nor does this test reveal that the negro associative reactions are slower, for whatever slight, though unreliable, advantage exists in speed lies with the negro.

TABLE 9

A COMPARATIVE ANALYSIS OF THE KENT-ROSANOFF FREE ASSOCIATION TEST

				Diff. in	$\frac{Diff.}{P.E.}$	$\frac{Diff.}{Q_W}$	Lap.	Diff.	
	Race	Median	Q	medians	$\frac{Diff.}{P.E.}$	$\frac{Diff.}{Q_W}$	Md.	favors	Cases
Most common responses	W	54.1	13.0	4.8	2.8	.37	66	W	152
	N	49.3	9.6				30		109
Time in minutes	W	6.9	1.0	.3	1.4	.30	41	N	143
	N	6.6	1.5				54		107

The Army Alpha, containing 212 problems in its eight different tests, presents a series of problem situations which supposedly require for success such different abilities as retention of a mental set, keen discernment of important relationships and clues, logical integrity of associative processes, comprehension of instruction, and use of acquired information. For this analysis, an attempt was made to equate the intelligence factor by pairing the negroes and the whites. The following procedure was used. The available data for both the negroes and whites gave 93 pairs, spread over the entire range for each race, which could be approximately equated. The range was separated into 30 divisions of four scores each; pairs were assigned within these limits; and the total sums of all scores for each group were also made practically equal. With this arrangement, dissimilarity in traits due to superior or inferior intelligence may be regarded as negligible, and any significant variation may be considered as indicating measurable differences in traits. It is important to note that with this plan of selected samplings, nothing can be inferred regarding the comparative general intelligence of the two races. Table 10 contains the results.

A similar comparison experimentally controlling intelligence

TABLE 10

A COMPARATIVE ANALYSIS OF ARMY ALPHA RESPONSES AFTER THE RACES
HAVE BEEN PAIRED FOR INTELLIGENCE

Part I: Rights.

Test	Race	Mean	$\sigma_{dist.}$	Diff. in means	$\frac{Diff.}{\sigma_{diff.}}$	$\frac{Diff.}{\sigma_W}$	Diff. favors
I	W	9.1	1.9	.3	.8	.15	W
	N	8.8	2.1				
II	W	11.8	2.9	.8	1.7	.28	W
	N	11.0	2.1				
III	W	10.9	2.6	.0	.0	.00	
	N	10.9	2.8				
IV	W	26.2	6.0	.5	.5	.08	W
	N	25.7	6.2				
V	W	16.0	3.5	1.3	1.9	.36	N
	N	17.3	3.8				
VI	W	10.5	2.7	.4	.8	.14	W
	N	10.1	2.6				
VII	W	20.3	8.0	3.6	2.3	.45	N
	N	23.9	8.6				
VIII	W	24.5	6.2	2.8	2.3	.47	W
	N	21.7	7.1				

While none of the differences in this table is reliable, in Tests II (Arithmetical Reasoning) and VIII (Information) sizable though unreliable differences favor the whites; in Tests V (Disarranged Sentences) and VII (Analogies), similar differences favor the negroes.

Part II: Wrongs.

Test	Race	Mean	$\sigma_{dist.}$	Diff. in means	$\frac{Diff.}{\sigma_{diff.}}$	$\frac{Diff.}{\sigma_W}$	Diff. favors
I	W	3.5	1.8	.5	2.0	.29	W
	N	4.0	2.0				
II	W	2.4	1.6	.2	.5	.09	N
	N	2.2	1.5				
III	W	1.3	1.0	.5	2.3	.50	W
	N	1.8	1.3				
IV	W	4.2	2.2	.3	1.4	.15	N
	N	3.9	2.1				
V	W	1.7	1.2	.5	2.0	.45	W
	N	2.2	1.5				
VI	W	3.3	2.7	.3	.7	.13	N
	N	3.0	2.5				
VII	W	6.8	5.6	1.0	1.1	.19	N
	N	5.8	5.1				
VIII	W	10.1	4.4	.1	.1	.02	N
	N	10.0	4.1				

Part III: Omissions.

Test	Race	Mean	$\sigma_{dist.}$	Diff. in means	$\frac{Diff.}{\sigma_{diff.}}$	$\frac{Diff.}{\sigma_W}$	Diff. favors
I	W	.2	1.2	.0	.4	.05	W
	N	.2	.4				
II	W	1.0	1.5	.0	.0	.00	
	N	1.0	1.7				
III	W	.1	.9	.0	.1	.00	
	N	.1	.9				
IV	W	.6	1.9	.6	1.5	.36	W
	N	1.2	2.4				
V	W	.2	.9	.7	2.8	.80	W
	N	.9	1.7				
VI	W	.4	.6	.0	.1	.03	W
	N	.4	.8				
VII	W	.3	.8	.1	1.2	.22	W
	N	.4	.8				
VIII	W	.0	4.3	3.8	4.7	.89	W
	N	3.8	4.5				

It is evident from this table that, in general, the negro consistently omitted more problems than did the white. In Test VIII (Information), the differential critical ratio is indicative of a real difference between the races, and, in Test V (Disarranged Sentences), it strongly suggests such a difference.

Part IV: Attempted.

Test	Race	Mean	$\sigma_{dist.}$	Diff. in means	$\frac{Diff.}{\sigma_{diff.}}$	$\frac{Diff.}{\sigma_W}$	Diff. favors
I							
II	W	14.2	2.6	.3	.9	.12	W
	N	13.8	2.1				
III	W	11.8	2.8	.4	1.1	.17	N
	N	12.2	3.1				
IV	W	29.9	5.8	.7	.7	.11	N
	N	30.6	7.1				
V	W	17.2	4.3	2.0	3.3	.46	N
	N	19.2	4.0				
VI	W	13.6	3.0	.5	1.3	.17	W
	N	13.1	2.5				
VII	W	27.9	6.4	.5	.5	.75	N
	N	28.4	7.4				
VIII	W	36.4	5.1	.3	.4	.67	W
	N	36.1	6.5				

The showing of the negroes in the number attempted needs to be considered in relation to their larger number of omissions.

on the basis of the total Alpha score was discussed in a Camp Sevier report (76). Two hundred negroes were paired with two hundred whites selected from the different letter ratings in the same proportion as these ratings occurred in the total negro draft. The results obtained (76, p. 738) "indicate that the negro as compared with the white man of equal intelligence is relatively strong in the use of language, in acquaintance with verbal meanings, and in perception and observation; and that he is relatively weak in judgment, in ability to analyze and define exactly, and in reasoning." This study, which gives the results only in the percentage of the whites' score, does not show whether these differences are actually great enough to be reliable. Also, the sampling is too largely weighted toward the low end of the intellectual scale for ready comparison with my own investigation. A very small percentage, less than 1%, of the pairs included made a total score above 104, and about 91% made a total score below 45; while, in my study, only 23, or 24.7%, were below 104, and none was lower than a total of 56.

From a reading of the tables and a comparison of the Camp Sevier report, several conclusions appear. In the first place, the white man is more persistent than the negro, for, in general, he consistently omitted fewer of the 212 problems. The negro seems to have a slight advantage with an almost significant number of rights in Test VII (Analogies). This at least suggests an ability to hold with greater fidelity an assigned mental set in spite of distractions due to frequency associations. The Camp Sevier report indicates that the negro is relatively strong in the use of language and relatively weak in arithmetical reasoning. Whatever evidence this study gives, although inconclusive, points in the same direction. Test V (Disarranged Sentences), with verbal material, has a suggested difference in favor of the negro, as evidenced by the critical ratios of 1.9 for rights, 2.6 for attempted, and 2.0 for wrongs; while Test II, with arithmetical problems, showing a critical ratio of only 1.7 for rights, slightly favors the whites. The critical ratios for the number of omissions and rights in Test VIII (Information) suggest that the white student may excel in the possession of general information. The use of such a test in a sampling of intelligence is justified on the ground that a greater fund of information will be gathered from a common environment by the more intelligent through their superior intellectual curiosity and ability.

However, because the respective environments are not essentially the same, this type of test needs to be very carefully scrutinized when used to compare individuals of different social status, different race, or different geographical sections. For example, sport terms are frequent in this test. It is entirely conceivable that one race because of unequal opportunity to participate in or observe sports, due either to expense, lack of leisure time, or enforced segregation and voluntary boycott as a result of it, may be decidedly penalized. Little weight, then, in the case of two races, can be given to the superiority determined by such a test when loaded with any one discriminating type of information.

A comparison of the conclusions gathered in these various tests brings out a few major points of difference between the two racial groups. Three tests, Otis, Rational Learning, and Atkinson, show that the white students have greater speed. Perhaps, without assuming quickness to be a recognized general factor, it is not too objectionable to suggest that the amount of this difference for similar functions may be represented by the median of the three differences, .58, .68, and .90, respectively, which is .68 *Q* units of the white distribution. The white group is also found to be more accurate in the Hard Opposites, Atkinson, and Myers tests, but the differences are assuredly reliable only in percentages of response. In addition, the negroes tend to give up their difficult problems more readily than do the whites, as evidenced by the analysis of the Otis, Alpha, and Myers tests. The amount of this difference in persistence might be represented by the single Otis measure, .73 *Q* units of the white distribution. Also from an analysis of the Rational Learning and Atkinson tests, a logical inference is that these negroes excel in memory. Although retentiveness is only partially isolated in the test, one measure in the Atkinson seems weighted with this trait. The difference in medians for this measure amounts to .55 *Q* units of the white distribution.

Nothing has been experimentally determined here as to whether the cause of the differences is environmental or native. At points, the environment by its influence seems to handicap the negro. A greater educational stress on memorizing subject-matter is not conducive to independence in observation of relationships or in judgment, both of which are required for success in intelligence tests. A lack of persistency may be derived from an environment in which submissiveness and surrender are of more practical value

than assertiveness and aggression. Slowness may be due to acquired slow and devious methods of work or less social motivation rather than to an inherently poorer reacting mechanism. Lack of accuracy may be due to an environment that is more content with slipshoddiness, lack of precision, and approximations. No separation of acquired or native traits is possible on the basis of the given tests with vital differences in the social status and environment of the tested groups.

Nor is it possible to infer general differences in certain traits for all negroes and all whites. One needs to be very careful in comparing individuals or groups not to label them all with any particular trait or to represent the groups by their averages, unless account is taken of their variability, and the difference is shown to be outstanding and reliable. The various contradictions in Table 1 clearly sound that warning. Also, inconsistencies appear between these tests, for example, in speed. Though the white students are more speedy in three tests, the negroes are quicker to respond in the Free Association test, which is somewhat unlike the others in the type of response required. In regard to traits it seems to be necessary to generalize less than is usually done and to specify more the particular function and test and group.

With the qualifications discussed in the last two paragraphs in mind, we can conclude, then, that differences as measured by these tests do exist between these two groups of white and negro college students. The trend of these differences seems to indicate that the white group studied is inferior to the negro group in the trait of memory, and superior in the traits of speed, accuracy, and persistence.

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UNE COMPARAISON QUANTITATIVE DE CERTAINS TRAITS MENTAUX DES COLLÉGIENS NÈGRES ET BLANCS

(Résumé)

Un résumé des études antérieures des différences de race montre fréquemment qu'on n'a pas inclus les mesures de variabilité, la constance des différences, et assez de sauvegardes contre la considération comme traits saillants de race les particularités des individus singuliers de la race moins

connue. Par conséquent, les résultats montrent naturellement des contradictions considérables. Dans cette étude, on a obtenu les données pour l'analyse des différences de traits des résultats de sept tests mentaux subis par de 93 à 187 collégiens nègres et par un groupe à peu près égal de blancs. On a analysé les tests pour trouver les éléments tels que le nombre et le pourcentage des réponses incorrectes, des divers types d'erreurs, des réponses correctes, des réponses partiellement correctes, des problèmes essayés dans une durée donnée, et des omissions. Tandis que quelques contradictions se montrent, la tendance des différences semble indiquer que le groupe des blancs étudiés est inférieur en mémoire et supérieur dans les traits de vitesse, d'exactitude, et de persistance. Si on donne les résultats de certains tests en unités d'erreurs probables de la distribution des blancs, on montre que dans ces cas la supériorité des blancs en vitesse est de 0, 68; en exactitude, le pourcentage des réponses seulement, 0, 55; en persistance, 0, 73; en l'absence de persévération dans la même sorte d'erreur, 0, 92; dans l'organisation logique d'une solution complexe, 0, 57. Les nègres sont supérieurs, par inférence, en pure mémoire, 0, 55 et dans la capacité de retenir avec une plus grande fidélité un problème mental donné malgré les distractions, 0, 45. Puisqu'on n'a rien déterminé expérimentalement pour montrer si la cause de la différence remonte au milieu ou à la naissance, les résultats sont capables de plus d'une interprétation.

GRAHAM

EIN QUANTITATIVER VERGLEICH BESTIMMTER GEISTIGER MERKMALE VON NEGER-UND WEISSEN STUDENTEN

(Referat)

Eine Zusammenfassung früherer Untersuchungen über Rassenunterschiede ermangelt oft Messungen der Streuungen, Zuverlässigkeit der Unterschiede und hinreichende Gewähr gegen Verwechslung von Eigentümlichkeiten exzentrischer Individuen innerhalb der weniger bekannten Rasse mit den prominenten Rassenmerkmalen. Dementsprechend weisen die Resultate beträchtliche Widersprüche auf. In unserer Untersuchung wurden die Data für die Analyse von Merkmalsunterschieden den Protokollen von sieben Tests entnommen, die 93-187 Negercollegestudenten und ungefähr derselben Zahl von weissen gegeben wurden. Die Tests wurden auf Elemente analysiert, wie Zahl und Prozente von falschen Antworten, von verschiedenen Fehlertypen, von richtigen Antworten, von teilweise richtigen Antworten, von versuchten Aufgaben innerhalb gegebener Zeit und von Auslassungen. Währenddem einige Widersprüche offensichtlich sind, scheint die Richtung der Unterschiede anzudeuten, dass die Untersuchte weisse Gruppe in Bezug auf Gedächtnis minderwertig und in Bezug auf Schnelligkeit, Genauigkeit und Ausdauer überlegen ist. Wenn wir die Ergebnisse der einzelnen Tests in Einheiten von Fehlerquellen der Verteilung unter Weissen niederlegen, so lässt sich in diesen Fällen zeigen, dass die Überlegenheit der Weissen 0.63 in Schnelligkeit; nur 0.55 in Genauigkeit, Prozent der Antworten; 0.73 in Ausdauer; 0.92 bei Abwesenheit von Erschwerungen derselben Art von Fehlern; 0.57 in der logischen Organisation einer komplizierten Lösung ist. Die Neger sind bei logischer Schlussfolgerung überlegen in blossem Gedächtnis (0.55) und in der Fähigkeit trotz Ablenkungen mit grösserer Treue an gegebenen geistigen Aufgaben festzuhalten (0.45). Da experimentell nicht festgestellt wurde, ob die Ursache des Unterschiedes auf Umgebung oder Vererbung zurückzuführen ist, sind die Ergebnisse mehr als einer Interpretation fähig.

GRAHAM

SPEED AS A PERSONALITY TRAIT*¹

From the Psychological Laboratory of Harvard University

MARGARET KENNEDY

There is a popular theory that some people are of a slow, stolid type and others of a quick, nervous type. The slow type is supposed to plod along persistently with great care for details and accuracy. The quick type, according to this popular theory, works in a more slap-dash fashion, has little regard for details, and is inclined to be inaccurate. These types are considered to be the result of temperament, not of differences in intelligence. In relation to all his actions one person seems to be geared to one level of speed and another to another. If this were true the speed of a person's work would be determined, in part, by this personality trait. His speed would also, of course, be partly determined by his skill in the particular task. For example, a practiced mail clerk will sort letters more quickly than a novice, although the latter may be of a quick, nervous type and the former of a slow type. This research was undertaken to discover if such consistent differences in speed of work actually exist.

The first source of evidence is indirect, growing out of a phase of an investigation² made to determine the relation of speed and quality of work. Different educational and mental tests were given to children and adults. The correlations between speed and quality in these tests were in every case positive but low. The correlations seemed to be lower in simpler tasks and higher in more complex. Of the school subjects, rate and quality were least related in handwriting, approximately .00, and most in arithmetic,

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¹The writer is deeply indebted to those subjects who gave their time and efforts to this research and even more indebted and grateful to Professor Walter F. Dearborn, who not only directed this work but also gave much helpful criticism and encouragement.

²A Ph.D. thesis in Radcliffe College Library by the writer entitled: "The relation of Speed and Quality of Work and Its Significance for Individual Differences."

from .203 to .783. In the Army Alpha, rate and quality were least related (.159) in the comparatively easy Test 3, Practical Judgment, and most in the comparatively difficult Test 1, Number Series Completion (.676). This is exactly what would be expected, if, as suggested above, personality differences exist which make some tend to work quickly and others slowly. As the tasks grow harder, these speed differences would tend to be overlaid by differences in skill so that the time taken to do a task would depend more and more on the person's skill in that kind of work and less and less on his general rate of work.

In order to differentiate this general trait from speed in a given task, it would be well to have a word to designate it. The term "irritability" is suggested in spite of the danger of confusing it with its physiological meaning. It will be used throughout this paper for the lack of a better word. On what, exactly, this general trait of "irritability" depends is a question for further research. Since this investigation was started, work has been done by others that supports this hypothesis of consistent individual differences in speed of work or "irritability."

WORK OF OTHERS BEARING ON THE PROBLEM

The question of the possibility of the existence of such speed types has not been taken up until very recently. There are, however, several studies published earlier that have a general bearing on the subject. In 1902 Aikens, Thorndike, and Hubbell (1), working with 160 8th-grade and 80 5th-grade children, found an average correlation of .51 between the amount done in addition and the amount done in three combined association tests. In 1914 Bridges (4) found that decision-times varied with the kind of material for the same individual. Trow (23), in 1925, found the same thing, his correlations ranging from $-.25$ to $.55$. In 1921 Mudge (16), on the basis of comparison of an accuracy test with intelligence tests, concluded that the very brightest students were the most accurate, and the very dullest the least accurate; but he found evidence in the middle groups of a slow, accurate type and of a quick, inaccurate type. In 1924 Bernstein (3) concluded against the existence of a "speed ability" after correlating teachers' estimates of slowness with differences of scores in leisure and haste tests, i.e., tests with short and long time limits. But teachers' estimates are a very imperfect measure, and the difference between scores on leisure and haste tests

is even less adequate as a measure of slowness. The differences in scores on the two types of tests were no greater than the differences in scores within the same type. In the case of these tests, as in work done by others on the effect of different time limits, the fact remains that the test with the short time limit is still a power test, and there is no assurance that a high score on such a test means speed or that a low score means slowness. In 1925 Clark (8) found a correlation of .50 between speed in an arithmetic test and speed in a sentence-completion test and one of .41 between speed in these tests and a composite intelligence test score. In 1925 Hunsicker (13), with 163 subjects, found correlations from .57 to .81 between speed in arithmetic and speed in sentence-completion, and a correlation of .39 to .61 between rate and level. She concludes that speed of work is an individual characteristic and that there is a fair relationship between rate and ability. In 1926 Peak and Boring (17), with five subjects, found a high correlation between speed of simple reactions and speed in group mental tests, timing each item of the tests which were given individually. These speed scores correlated highly with intelligence test scores. In 1926 Dowd (9), using 165 children's scores on cancellation, speed of movement, writing, reading, and arithmetic tests, found intercorrelations of the rates of these tests ranging from .139 to .810, showing consistency in speed, although this is somewhat disparaged by the author. Correlations between these rate tests and intelligence tests ranged from $-.084$ to .298, showing little relation between rate and intelligence. In 1926 Sisk (20), with 100 adults, found little relation between speed in simple and in more complex tests. In 1927 Walters (24) found intercorrelations of rate tests ranging from .1703 to .6942, with all but one over .40. These rate tests were of reading, arithmetic, and cancellation tests, the number of items attempted on nine subtests of the National and Otis intelligence tests, and the amount of time used in completing intelligence tests. These rate tests correlated from $-.0015$ to .4515 with power tests consisting of Binet M.A.'s, school marks, school promotions and teachers' judgments, and a group of achievement tests. The total rate composite correlated .267 with the total intelligence criterion. These results give evidence of consistency in rate of work and little relation between this consistent rate and intelligence. The general conclusion to be drawn from this array of experimental material is that there is persistent evidence of

consistency in rate of work, but that it does not appear in those cases where a sharp division and comparison is made between simple and complex tasks.

It has been suggested by Peak and Boring (17) that these consistent differences in speed may be due to intelligence. Speed and intelligence seem to be related according to Clark (8) and to Hunsicker (13), but opposed to them are Dowd (9) and Walters (24), who found their rate measures unrelated to intelligence. Other investigations have been made which have a bearing on this question. In 1909 Burt (6) found correlations ranging from .41 to .61 between estimates of intelligence and different speed tests. In 1910 Brown (5) found negligible correlations between estimates of intelligence and cancellation tests. In 1913 Wyatt (26), also using estimates of intelligence, got correlations ranging from .32 to .45 between cancellation tests and intelligence. In 1915 Webb (25) found a correlation of .85 between estimates of quickness of apprehension and estimates of intelligence, a purely subjective study and really not relevant here, as "quickness of apprehension" is not a measure of general speed of work. In 1916 McCall (14) found correlations ranging from $-.34$ to .49 for speed tests and group power tests, and in 1918 McCall and Ruger (15) concluded from work with speed and power tests that "for a test to show a close correlation with mental ability it should emphasize how difficult a task can be performed rather than the rate of performance." In 1917 Anderson (2) concluded that there was no relation between speed of association and intelligence. In 1921 the Army test report (27), and in 1923 Ruch and Koerth (19) gave results of the correlations of Army Alpha scores in standard time limits with scores of longer limits, finding a very close correlation. This has been interpreted by some as showing a relation between rate of work and intelligence but it seems better interpreted as showing that speed of work plays a very minor rôle in determining the Alpha scores in standard time with an average group. In 1923 Freeman (11) found negative correlations between time and ability scores on a summer school course examination. In 1924 Chapman (7) found a slight correlation between speed of thought and success in a word-building test. In 1925 Highsmith (12), finding correlations of .33 and .56 between rate tests and the Binet, of .57 and .88 between rate tests and the National Intelligence test, and of .64 between the Binet and

the National, concluded that rate of response is by no means a safe measure of intelligence. In 1927 Farnsworth, Seashore, and Tinker (10) found that speed in simple reactions had a slightly negative correlation with speed in intelligence tests, and that speed in serial reactions correlated .50 with Alpha, .30 with Otis, .20 with Thorndike, and .14 with Ohio State, from which he concludes that the Alpha tends to become merely a serial reaction test, whereas the Thorndike and Ohio State remain more clearly content tests. In 1928 Travis and Hunter (22) found surprisingly close correlations between conduction rate in the knee-jerk reflex and Otis scores and between this reflex time and the University of Iowa examination, the coefficient being .87 in each case. Also, Rounds (18) found a correlation of .59 between rate in the patellar reflex and a battery of mental tests. As far as any general conclusion can be drawn from such diverse material, it can be said that there is some correlation between rate of work and intelligence, but the correlation is so low that rate of work is a very poor measure of intelligence. The work of Travis and Hunter (22) and of Rounds (18), although more or less contradicted by Farnsworth, Seashore, and Tinker (10), is impressive enough to raise the question as to the source of this lack of relation between speed of work and intelligence. It would seem to lie in a more complex function than the rate of nervous conduction in the simplest reflexes. It may be due to central inhibitions or some other personality factors.

EXPERIMENTAL WORK

As stated above, earlier work done on the relation of rate and quality of work in school subjects and mental tests gave correlations between rate and quality which were low enough to indicate some factor disturbing the relation. It was thought possible that consistent differences in speed of work, "irritability," might be the factor at work. To see if such differences exist, a study was made of 20 adults, graduate students in Harvard and Radcliffe in 1922 and 1923.

Tests Used. It was decided that if there were consistent individual differences in speed of work that they should appear even in a simple reaction. For this reason a series of reaction tests were given. The first was a simple reaction with the right hand and the same thing with the left hand, the stimulus being the click of a telegraph key. The second was a choice reaction, the directions being

to use the right hand if an *R* appeared in the stimulus box, and the left if an *L* appeared. The third was a choice reaction involving judgment. The subject was required to read a simple sentence and, if the sentence was true, he used his right hand, if false, his left. The fourth was similar; if a simple sum was correct, the subject used his right hand, if wrong, his left. The fifth was to say into a voice box the opposite of the word which appeared on the stimulus card. The sixth was to read aloud the word which the card represented. The seventh was to say the last word read as soon as the click was heard. After a practice period with the simple and choice reactions, this series was repeated 10 times and the trials averaged. The timing was done by means of a string galvanometer attached to the apparatus and calibrated before and after each experiment.

Results

Validity of the individual differences. The differences between the subjects studied were great enough to indicate a real difference in speed of work for all types of reactions. The times for the simple reactions ranged from 134 σ to 348 σ ; for the choice reactions, from 360 σ to 605 σ ; the reactions to sentences, from 1110 σ to 4000 σ ; the reactions to sums, from 1200 σ to 6520 σ ; the simple vocal reactions, from 200 σ to 755 σ ; the reading reactions, from 614 σ to 1160 σ ; and the giving of opposites, from 933 σ to 1480 σ . These differences were considered great enough to differentiate the subjects in every case.

Consistency of individual differences. Intercorrelations of these rate tests ranged from .11 between sentences and simple touch reactions to .81 between the opposites and the reading reaction, with an average correlation of .45. These correlations, shown in Table 1, show a distinct tendency for an individual to be consistent in speed of reaction. There is also a certain amount of hierarchical order, which there should be if there were a group factor, unless the tests were too similar. Because of the fact that the sentences are so similar to the sums and the voice reactions resemble each other so much, one would not expect good hierarchical order, as Spearman points out that the criterion fails with abilities that overlap. There are, however, no greater discrepancies here than in many of the figures which Spearman (21) gives in his book. His correctional formula was not used, as there is so much difference of opinion as to its validity.

TABLE 1
INTERCORRELATIONS OF RATE MEASURES FOR 20 SUBJECTS

	Read- ing	Oppo- sites	Word	Right- left	Sentences	Sums	Simple reactions
Reading		.81	.75	.71	.44	.41	.25
Opposites	.81		.63	.42	.48	.32	.17
Word	.75	.63		.66	.43	.42	.38
Right-left	.71	.42	.66		.34	.46	.52
Sentences	.44	.48	.43	.34		.77	.11
Sums	.41	.32	.42	.46	.77		.23
Simple Rs.	.25	.17	.38	.52	.11	.23	

Subjects ranked according to speed. Each subject was given a speed rank on the basis of his composite score in these tests. Each test was given equal weight except the two simple reactions with the right and left hands, which were together given the value of one test.

Correlation of speed ranks with rate on the Alpha. If these speed ranks are true measures, they should be related to speed of work, unless that work is too specialized or too difficult. For this reason a correlation was made between these ranks and speed in the Army Alpha as measured by the number of items attempted in half time. This measure of speed was obtained by counting the number of answers actually put in the correct place, whether those answers were right or wrong. The correlation between the rate on the Alpha, thus determined, and the speed ranks was .486. As pointed out above, the speed of work in the Alpha would be partly determined by the level of ability of the subject, so this correlation was not expected to be perfect. It is high enough, however, to support the hypothesis that these ranks really do measure a general speed characteristic.

Relation of speed ranks to intelligence scores. In order to determine whether these differences were based on intelligence, a correlation was made between these ranks and scores on the Army Alpha. Like most adult tests, the Alpha is a "speed test" and its score gives quite a little weight to speed. For this reason the test was given with double time and correlations made with the scores of standard time and with those of double time. The correlation of the speed ranks and Alpha scores for standard time was .54, and of the speed ranks and Alpha scores for double time it was .00. The interpretation of this result depends on the nature of the Alpha

examination with the increased time limits. Is it still an intelligence test? The Alpha with double time correlated .57 with official time scores for these same 20 individuals. Walters (24), in a study of other group tests, including the Otis and the National Intelligence tests which are similar to the Alpha, discovered that extended-time scores had a slightly higher correlation with composite measures of intelligence than standard-time scores. This raises the suspicion that the correlation of .57 between the speed ranks and standard-time scores on the Alpha is not a true measure of the relation of these speed differences to intelligence, but that it is nearer the .00 obtained between these ranks and the double-time scores.

Conclusions

1) The intercorrelations of the rate tests, ranging from .11 to .81, with an average of .45, indicate that there is some consistency in individual differences of rate of work.

2) These differences are not correlated with Army Alpha double-time scores.

3) The intercorrelations of the rate measures and their lack of correlation with Alpha double-time scores support the hypothesis that a more or less consistent rate of work is a personality trait, such as has been called "irritability."

A FURTHER STUDY OF IRRITABILITY

In April, 1926, Peak and Boring (17) reported work on five subjects which corroborated the evidence of individual differences in general speed of work. Contrary to our results, however, there was found a high correlation between these individual differences and intelligence. To investigate the problem further, a research was undertaken in the summer of 1927 with 32 adults, all students in the Harvard Summer School.

Criteria of Speed. As before, a battery of tests was used to study speed of reaction. These included the Woodworth-Wells Substitution Test, Whipple's Cancellation Test, both forms of Woodworth-Wells Simple Directions Test, their Color-Naming Test, and three reaction-time tests. The reactions were timed by a Dunlap chronoscope. The first reaction test was a simple muscular reaction in which the subject was required to press a key as soon as he heard the click of the experimenter's key. The second was a free association test in which 20 words were used as a basis for measuring

the time. Words were chosen, as far as possible, which eliminated emotional reactions. In case of complete inhibition or of extraordinary lengthening of any one reaction, that work was omitted from the calculations. The third test was the giving of simple opposites. As before, any reaction extremely different from the subject's general average was eliminated.

Criteria of Intelligence. The tests of intelligence used were the Otis Self-Administering Test, Advanced Examination, and the Terman Group Test of Mental Ability, for grades 7 through 12. The Otis test was given as part of the work of the class in educational psychology in the Harvard Summer School. Since it has been thought by many people that the validity of even a group test seems to be improved by its being taken alone with the examiner, the Terman test was given individually to each subject. The intelligence rating of each individual is based on the combined scores of these two tests, equal weight being given to each.

Reliability of the Tests and Validity of Individual Differences. In order to test the reliability of the rate tests, the whole series was given twice. Correlations of these two trials showed a high reliability except in one case. For the substitution test the correlation was .74; for the two directions tests, .84; for the simple reactions, .91; for the free association test, .89; and for the easy opposites, .85. The cancellation test showed a self-correlation of only .19 and was not considered further. The two intelligence tests showed a correlation of .74. Aside from the question of the consistency of results, the tests were valid from the point of view of giving sufficiently great differences between the subjects to distinguish them on the basis of the tests. The difference between the highest and lowest individuals was great enough in every case to justify the use of all of the tests. The time scores for the substitution test ranged from 80 seconds to 159 seconds; for the color-naming test, from 41 seconds to 76 seconds; for the directions tests, from 67 seconds to 188 seconds; for the simple reaction test, from 154 σ to 285 σ ; for the free-association test, from 822 σ to 1566 σ ; and for the opposites test, from 633 σ to 1254 σ .

Intercorrelations of Rate Tests. Correlations were made between each of the tests in the battery of speed tests. These correlations range from .02 to .70, with an average of .34, as shown in Table 8. The corrected coefficients range from .02 to .95, with an average of

TABLE 2
INTERCORRELATIONS OF RATE TESTS—RAW COEFFICIENTS

	Substi- tution	Color- naming	Oppo- sites	Direc- tions	Free as- sociation	Simple reactions
Substitution		.70	.48	.44	.38	.21
Color-naming	.70		.48	.46	.36	.24
Opposites	.48	.48		.28	.56	.02
Directions	.44	.46	.28		.38	.06
Free association	.38	.36	.56	.38		.10
Simple reactions	.21	.24	.02	.06	.10	

TABLE 3
INTERCORRELATIONS OF RATE TESTS—CORRECTED COEFFICIENTS

	Substi- tution	Color- naming	Oppo- sites	Direc- tions	Free as- sociation	Simple reactions
Substitution		.95	.60	.57	.47	.26
Color-naming	.95		.60	.60	.44	.29
Opposites	.60	.60		.33	.64	.02
Directions	.57	.60	.33		.44	.07
Free association	.47	.44	.64	.44		.11
Simple reactions	.26	.29	.02	.07	.11	

.42, as shown in Table 3. Although these correlations are not high, they are too consistent not to indicate some common factor at work. Also it can be seen from looking at these tables that there is some evidence of hierarchical order. In general, the correlations decrease from left to right and also decrease in a vertical direction. The exceptions are no greater than those given as evidence of hierarchical order by Spearman and interpreted by him as an indication of a unit factor. Spearman's correctional formula of determining the *P.E.* of the tetrad differences was not applied. Aside from the evidence of hierarchical order, the fact that all the correlations between these tests of speed are positive, and that some of them are quite high, shows that there is some consistency in individual differences in rate of work. It indicates that the individual who is quick in one task is more likely to be quick than slow in another.

Relation of these Speed Differences to Intelligence. Since Peak and Boring (17) considered that consistent speed differences such as these were merely indices of differences in intelligence and not differences in "irritability," correlations were made between these tests and intelligence, as measured by the combined scores of the Otis and

Terman tests. The correlations between these tests and intelligence so measured ranged from $-.32$ to $.42$, with an average of $.06$, being in detail as follows:

Simple reactions and intelligence	$-.32$
Opposites and intelligence	$-.06$
Cancellation and intelligence	$.04$
Color-naming and intelligence	$.06$
Free association and intelligence	$.12$
Substitution and intelligence	$.16$
Directions and intelligence	$.42$

These correlations seem to eliminate the possibility that intelligence is at the basis of the "irritability" differences. As a further study of the relation of these differences to intelligence, speed ratings based on the speed tests were made, giving equal value to each test, and these were correlated with the combined scores of the intelligence tests. The resulting coefficient was $.14$. This very low correlation, less than twice the probable error, also indicates that intelligence is not at the basis of these speed differences. As a last proof of this same question, partial correlations were made between the rate tests with intelligence constant, giving coefficients as shown in Table 4.

TABLE 4
INTERCORRELATIONS OF RATE MEASURES (RAW COEFFICIENTS) WITH
INTELLIGENCE CONSTANT

	Substi- tution	Color- naming	Oppo- sites	Direc- tions	Free as- sociation	Simple reactions
Substitution		.605	.496	.416	.372	.280
Color-naming	.605		.485	.479	.356	.275
Opposites	.496	.485		.336	.572	.001
Directions	.416	.479	.336		.365	.226
Free association	.372	.356	.572	.365		.147
Simple reactions	.280	.275	.001	.226	.147	

These correlations, ranging from $.001$ to $.605$, with an average of $.361$, show that there is still a definitely positive relation between these measures when the possible effect of intelligence differences is eliminated. These figures indicate that there are real "irritability" differences which are not based on intelligence. No hypothesis is offered as to the ultimate basis of these differences which are apparently personality differences.

Conclusions

1) From these results, which are supported by the evidence of others, one may conclude that there is a tendency for a person who is quick in one task to be quick in another. As suggested above, the use of a special term, such as "irritability," to describe this general rate of work would aid in clear thinking.

2) This "irritability" has no relation to intelligence.

3) This "irritability" is one factor in determining rate of work in any given task.

4) The more complex the task, the less effect does this "irritability" have in determining the speed of work.

5) The more complex the task, the greater is the effect of general intelligence in determining the speed.

6) The basis of this "irritability" difference has not been determined. If Travis' work is confirmed, it probably does not lie in the speed of conduction of the nerve paths. It is probable that it depends on whatever is at the basis of other personality differences, possibly on varying output of different glands. The existence, however, of a rash, impulsive type that does everything quickly and of a slow, cautious type that does things slowly has long been popularly recognized, whatever its physiological or psychological explanation may be. This research presents statistical evidence in support of this popular idea and suggests that "irritability" or a characteristic rate of work be considered a personality trait.

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LA VITESSE COMME TRAIT DE PERSONNALITÉ

(Résumé)

Cette enquête propose la théorie que la vitesse générale du travail est un trait de personnalité. Elle présente de l'évidence statistique de différences individuelles constantes dans la vitesse du travail lesquelles n'ont aucun rapport avec "l'intelligence" comme mesurée par les tests étalon. On a fait subir divers tests de vitesse à 24 adultes. Ceux-ci ont eu une intercorrélation moyenne de 0,45 et il y a eu quelque évidence de l'ordre hiérarchique indiquant un facteur d'unité. Ce facteur ne semble pas être l'intelligence parce que les résultats de la vitesse basés sur ces tests n'ont eu aucune corrélation avec les résultats d'un test d'intelligence subi avec le temps doublé. Une autre étude de 32 divers adultes a montré des intercorrélations de tests de vitesse donnant en moyenne 0,34 coefficients non corrigés et 0,42 coefficients corrigés. Dans ce cas aussi on a pu arranger les coefficients dans un ordre assez hiérarchique indiquant un facteur d'unité. On conclut que ces différences constantes de vitesse ne sont pas dues à l'intelligence parce qu'il n'y a pas de corrélation entre ces tests de vitesse et ceux d'intelligence et parce qu'il reste après l'exclusion des effets de l'intelligence par une corrélation partielle une intercorrélation moyenne de 0,361 entre les tests de vitesse. On suggère que l'on emploie le terme "irritabilité" pour désigner ce trait de vitesse pour éviter la confusion causée par le fait qu'une personne généralement rapide peut être lente dans une tâche spécifique s'il manque d'entraînement ou de capacité.

KENNEDY

GESCHWINDIGKEIT ALS CHARAKTERZUG

(Referat)

Diese Untersuchung schlägt die Theorie vors, dass allgemeine Geschwindigkeit in der Arbeit ein Charakterzug sei. Es legt statistische Beweise für konsequente individuelle Unterschiede in der Arbeitsgeschwindigkeit vor, die in keiner Beziehung zur "Intelligenz" stehen, wie sie durch Normaltests zu messen ist. Verschiedene Geschwindigkeitstests wurden 24 Erwachsenen gegeben. Diese hatten eine durchschnittliche Interkorrelation von 0.45, und es bestand einige Gewissheit für eine hierarchische Ordnung, die einen Einheitsfaktoren anzeigt. Dass dieser Einheitsfaktor nicht Intelligenz ist, ist durch die Tatsache erwiesen, dass die auf jene Schnelligkeitstests basierten Geschwindigkeitsdata keine Korrelation mit den Data eines Intelligenztestes hatten, der mit doppelter Zeit gegeben wurde. Eine weitere Untersuchung von 32 verschieden Erwachsenen wies Interkorrelationen unter den Geschwindigkeitstests von durchschnittlich 0.34, Rohkoeffizienten, und von 0.42, korrigierte Koeffizienten, auf. In diesem Fall konnten die Koeffizienten auch in eine ziemlich deutliche, hierarchische Ordnung eingereiht werden, die einen Einheitsfaktoren ergab. Dass diese konsequenten Geschwindigkeitssunterschiede nicht auf Intelligenz zurückzuführen sind, wird daraus geschlossen, dass keine Korrelation zwischen diesen Geschwindigkeitstesten und Intelligenz besteht, und dass nach Ausschluss des Intelligenzeffektes durch partielle Korrelation eine durchschnittliche Interkorrelation von 0.361 unter den Geschwindigkeitstests bleibt. Es wird vorgeschlagen, den Ausdruck "Reizbarkeit" (irritability) zu gebrauchen, um dieses Geschwindigkeitsmerkmal zu bezeichnen, damit eine Verwirrung vermieden werde, die daraus entstehen könnte, dass eine im allgemeinen schnelle Person in einer besonderen Aufgabe langsam sein kann, falls es ihm an Übung oder Fähigkeit fehlt.

KENNEDY

THE HOMING BEHAVIOR OF BEES*

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For a great many years biologists and psychologists have been interested in the homing behavior of insects. A great number of isolated facts were collected, such as are described by Fabre, Forel, Lubbock, and others. In most of these cases no particular experiments were made to determine the factors that give insects the ability to find their way home after having collected food far away from their nests. It was necessary to find an animal for which the experimental conditions might easily be controlled, and which could be handled by the experimenter in an easy manner. The insect with which most of the experimental work about homing has been done is the honeybee, for two reasons: first of all, it easy to keep these insects in sufficient number and under similar conditions; secondly, people knew a great many facts concerning their conduct, so that no preliminary studies in this respect had to be made.

In 1898 a paper was published by Bethe (1) in which a description of the homing instinct of the bees was given. Bethe, however, was not able to give a clear-cut definition of the main factors underlying the ability to find the way back to the hive. He postulated an unknown force which causes the bees to come back to their hives.

Bees accustomed to find their hive in a certain place, on coming home from the fields, go straight to the opening of the hive without any hesitation. If the hive is moved to one side for a certain distance, the bees return to that point in the air where the entrance hole of the hive was before the removal was made. This fact seemed inexplicable to Bethe, who said: "The bees are brought back to the hive by a force which is absolutely unknown to us. This force is not connected with the hive directly; it does not bring the bees back to the hive itself but to the point in space where the hive is usually located."

An unknown force is an inadmissible thing in science, and it was

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natural that a great many people started experiments to discover the force in question.

An attempt to discuss the literature concerning these experiments and the attached theoretical considerations would be quite impossible. Apiarists of all nations wrote about the matter in all bee journals, and the final outcome was that the matter was dropped after about four years. The only one who repeated Bethe's experiments was von Buttel-Reepen (4). He came to the conclusion that the orientation of the bees was quite explicable by the factors of orientation we knew before. Only in one point he could not get results that fitted the old theory. His answer was that in this case the conditions must have been so absolutely unnatural that the expected results could not be obtained.

The matter was dropped, as other questions seemed more important. First of all it was necessary to investigate the different possibilities of optical orientation, orientation by smell, and so forth.

Kathariner (13) performed some experiments on the color-sense of bees. Large sheets of yellow cardboard were placed in front of the hive and the bees were trained to use these as marks for orientation. After a certain period of training, the hive, with the bees, was moved to the right and another hive put in its place with another color. The bees coming back from the fields used the color to a great extent as a mark of orientation and went to the yellow hive in the new place. The experiments were modified in several ways, but the effect was always about the same. Kathariner came to the conclusion that apparently vision is the most important factor in orientation. "An unknown force whose location Bethe is unable to demonstrate does not bring us any further" toward an explanation.

Bethe never said that optical and olfactory excitations are not important for orientation, but to him it seemed impossible to give a complete explanation of the mechanism of orientation by appeal to these.

Better results were obtained by using training methods. Lubbock (18), Wery (21), Knoll (14, 15), and some others studied carefully the training effect of certain colors of blossoms outside of the hive. They all show that colors are used for orientation and discrimination of objects of the same geometric form.

A great difficulty in the explanation of the previous results was brought about by the experiments of von Hess (11, 12). Using a great many invertebrates, he came to the conclusion that none of

the lower animals has any color perception whatsoever. But his assumption did not hold for very long, because the classic experiments of von Frisch (8, 10), Kühn (16), and Pohl (17) showed clearly that von Hess had been wrong.

Von Frisch developed a training method which could be used for a great many very important and reliable experiments not only for the study of color perception in bees but for the olfactory sense and the whole system of communication of the different members of a colony of bees among themselves. This method has been of great value for the last 15 years and is worth discussing in detail.

It is possible to train a certain number of bees to come to a certain place to collect food. To avoid any experimental errors, a sugar solution may be used which has no particular odor. The bees are marked with color spots on their backs so that one can keep track of them by combining different color spots to give a system of numbers. If the food is given in a glass jar, which is placed upon a sheet of paper of a certain color, the bee is able to associate with the effect "food" the excitation of "blue," or of "yellow," etc. In the experiments, one colored paper is placed among a series of papers of different degrees of brightness. The bees coming back to the feeding place must use the color of paper as a mark for orientation and come back to the colored sheet, if they are able to distinguish a colored paper from another paper with a certain degree of brightness. If the bee were color-blind, it would use indifferently the colored paper or another paper which is equal in brightness to the training paper. In all the experiments the bees were always able to find the colored paper when blue and yellow were used for training. With red, difficulties arise, in that it can be easily exchanged with a dark grey or black paper. Green can be taken as a color for training, but the bees are not always sure in finding it among the others.

The same method was applied for testing the ability to distinguish different odors. Watch glasses containing a sugar solution were used, to which a certain etheric oil was added. The results were astonishing. Odors of very little intensity can still be distinguished where our organs of smell are no longer capable of distinguishing.

Color and smell can be combined, and a test can be made showing how they interfere with one another. Experiments in this respect showed that for rough discrimination of objects, the optical impressions are used; for finer distinction the smell sense is of greater importance.

Von Frisch's experiments finally extend to the study of the "language" of the bees. In a very interesting way the whole system of communication in a hive is analyzed. The knowledge of a newly found source of food is brought to the hive by one animal and by certain dancing movements the other members of the colony are mobilized. The particular odor of the species of flowers serves as an indicator for the others to go out and search until they have found a feeding place which has the same smell as the one which was brought to the hive by the communicating bee.

All these experiments on vision, sense of smell, and communication are of extreme importance for a further analysis of the homing instinct. According to Bethe, it is apparent that we have to deal with a very complex phenomenon, in which a great many factors have to do with the orientation. It will be necessary to base a new study upon von Frisch's results to see whether it is possible to give a clear-cut explanation of homing, or whether it will be necessary to seek another kind of factor in orientation.

Upon counting the number of bees coming back to the hive within one minute, it was found that the number is constant under normal conditions. As soon as a change is made at the hive, such as displacements in any direction, colored papers being placed in front of it, or a certain odor given to it, a difference in the number of bees coming back to the hive in one unit of time can be found, which indicates the effect of the change made. Thus one has a quantitative measure for the effect of different factors of orientation in homing. If new movements of the hive are made, it will be possible to compare the results of a dislocation of the hive with those where the same dislocation was made but as further mark of orientation a colored paper has been added. A great many data were obtained in this way. They all showed clearly that all the factors we knew before are of importance for orientation, but that after all they are not sufficient to give the complete picture desired.

A few occasional observations give some indication that there must be one other factor, such as an ability to register the angles and turns made during a flight.

Bees coming back from the fields have to fly across the roof of a certain hive. At the edge of the roof they must make a sharp turn to find the entrance. The edge of the roof is used as a mark of orientation and indicates the amount of turning required to arrive at the entrance. For feeding purposes in early spring the roof had

to be lifted higher up so that a bottle with sugar solution could be placed between the hive and the roof. By so doing, the distance between the edge of the roof and the front hole of the hive was doubled. The returning bees, coming across the roof, took the same turn on the edge as before and flew directly against the wall at the same distance from the edge as before the roof was raised, thus missing the hole. This observation shows clearly that the bees used the angle of turning over the edge of the roof more than the vision of the hive for getting to the hole.

Several other observations of the same kind showed exactly the same thing. Even in earlier papers observations of this kind were published, without their having been used for any further conclusions.

In another set of experiments the ability to obtain correct knowledge of a certain position is still more striking. Bees brought in a dark box to a field, which is so far from the hive that it is impossible for them to find the way back, are able to orient themselves, within an extremely short time, to the box in which they were transported. The box is placed on the ground and opened; the bees fly up into the air, circle for a while, and return to the box, where they remain apparently unable to return to the hive. If, now, during the time the bees are up in the air, the box is moved about two yards, the bees return not to the box but to the place on the ground where the box was before. The same phenomenon can be shown by putting the box high up into the air on a stick. In this case the bees circle around the place for hours in very small loops, even after the box has been removed. In all these cases the marks of orientation are very slight, and the time available to the bees for orienting themselves is so extremely short that the assumption of a special system of orientation is almost unavoidable. The only question would be whether we should stop our analysis just here, as Bethe did, assuming an unknown force, or whether we will be able to obtain a satisfactory answer by other experiments.

Making the assumption that the bees are able to register turns and angles made on a flight, we ask whether it will be possible to obtain a disturbance of orientation by causing the bees to make more turns on a certain path, or by removing the organs that may register the effects of movements made. How really positive results were obtained in such experiments can be best shown by giving a description of the actual procedure of the experiment.

About 250 yards away from a hive a point is chosen which lies well within the limits of the daily collecting ground of the bees and is consequently well known to the animals used in these experiments, so that they are perfectly sure to find their way back from that point to the hive. Each bee is marked in a certain way. In front of the hive bees are caught, marked, and brought to the point already mentioned. There we let the bees fly away and note the exact time. At the hive the returning bees are caught by another person and the numbers of the individuals and times of arrival are registered. Now we are able to compute the time which was necessary for each bee to cover the distance from the chosen point to the hive. Other bees are treated in exactly the same manner, except that the cage or box in which they are transported to the place where they are set free has been constantly rotated during the transportation. If now we assume that normally the bees had made only a few turns, and the number of rotations was now very much higher, we ought to expect a disorientation which should be apparent in the longer time necessary for these bees to make the return journey to the hive. The experiments show in fact quite a remarkable difference between the two groups, amounting to about two minutes. If these results are really significant for the assumption previously made, our next problem is to locate the organs concerned in the registration of the turns and movements made.

In the experiments where the bees were taken away from the hive and the orientation to the transportation box was studied, one fact was extremely interesting, namely, that bees whose antennae had been removed acted differently from the others in so far that they did not come back to the place where the box was put at the beginning of the experiment, but that they went in most of the cases to the box in the new place. This fact seemed to indicate that some organs of the antennae are connected with the ability to register the movements made by the bees.

If, in the experiments where we obtain a disorientation by simply turning the bees in the cage during transportation, we use bees in which the antennae are removed, and if we make the assumption that organs in the antennae are really organs which register movements made, we have to assume that bees of this kind show no difference in the time of coming back, regardless of whether they have been transported quietly or constantly rotated. Many tests made during different years always showed the same results. No difference what-

soever between the two groups could be observed. This proves that organs were removed that are affected by turning movements, and as soon as they are removed a registration of any movements made with the animal in the transportation box is no longer possible.

With these results we have the first indication of one further factor in orientation which was hitherto unknown. It is the first step in the explanation of the "unknown force" which brings the bees back to the hive, as postulated by Bethe.

Knowing that the bees are able to register movements made, the next thing would be to find out how this factor of orientation is connected with the others we knew about before. The facts previously mentioned where the bees were found to associate turns with the optical impression of the edge of the roof makes it probable that at all times during orientation the angles that have to be described are always in connection with optical impressions of marks on the way.

To what extent these factors can replace one another in orientation can be studied nicely on a field where optical marks are reduced to a minimum, so that artificial marks can be added and it can then be observed to what extent an orientation is possible without the added marks.

In such experiments a hive was put on a large field of sand. The first problem was to determine whether the bees would be able to acquire knowledge of the normal position of the hive when orientation marks were missing. After a relatively short time the bees in fact always returned to the place where the hive normally stood, after it had been moved to one side. For this fact two causes can be assumed: first, it might have been possible that, after all, the marks on the ground were sufficient for orientation; secondly, the bees might have used other marks which were located far outside the immediate field of experimentation.

The bees were accustomed to fly away from the hive and come back to it in the same direction. This fact might have been the reason that the bees were so well able to find the normal position of their home. To be quite sure, a feeding place was arranged at about 150 yards distance from the hive. The bees had now a definite path away from the hive and back to it. If now the hive was moved, the difficulty of finding it in the new place became greater because the direction of the flight was so definitely fixed.

Furthermore it was of interest to find out how easily the bees were able to reach home from any other place in the field. For this

study bees were caught at the feeding place and brought to places 150 yards to the right, to the left, or behind the hive. By observing the start of the insects one could see that they always took a direction which should have been taken from the feeding place to get home. The bees actually took ways parallel to the one they described on their way from the hive to the feeding place, and thus they missed the hive by a considerable distance. On the other hand, one could observe that only a distance of about 150 yards was travelled by the animals; as soon as they had gone this far from the starting-point they stopped their direct flight, described circles, and came back to the hive very much later than if they had taken the direct way. Quantitative measurements were made, exactly as indicated before, as well as comparisons of the times necessary to find the hive from the different points. If we take the time to cover the distance from the *feeding place* to the *hive* as one, the time to find home from the points 150 yards right or left from the hive was *three times* as long, and from the point 150 yards behind the hive *six times* as long. The relationship between the values obtained shows clearly that the observation made was correct, namely, that the bees took a path parallel to the original one, because the paths that must be traversed become proportionately greater as the distances of the paths back to the hive are lengthened.

It was obvious that there must have been some special mark of orientation which was lying outside of the field of experimentation. Since even at a great distance there were no optical marks that could have been used, the only probable relevant object was the light of the sun, from which the bees could have taken their angles of orientation. This assumption was justified by the results of experiments made on ants by Brun, Santschi, Piéron, and others, in which it was clearly shown that the position of the sun was important for the orientation of the ants. For bees the experimental test was yet to be made.

A bee coming to the feeding place uses the light as a means of orientation. At the feeding place the animal is put into a dark box and kept there for one hour; in the meantime the position of the sun has changed; if the bee on the flight back to the hive uses the position of the sun for its orientation it has to take a direction which is turned to the right by about the same angle as the sun moved within one hour. We may then expect the bee to miss the hive on the way back, and to reach it later than when flying in the ordinary

direct way. Knowing the time to cover the direct distance we are able to compare it with the time for bees kept in the dark for one hour. It was found that in this case the time was about *three and one-half times* as great as normally. On the other hand, it was to be expected that bees which were kept in the dark would reach the hive in the normal time as soon as the hive itself was moved through about the same angle as the sun changed its position in the meantime. The results obtained showed such a small difference between these figures and the normals that the time can be regarded as the same. Here-with we have an explanation for the conduct of the animals on the field with no particular marks of orientation, and a further indication of the way in which the ability to register angles takes part in orientation.

Just as in earlier experiments on a field covered with optical marks of orientation, the effect of rotating the bees and taking off the antennae could be studied on the sand field. These results checked perfectly with the older ones, except that the bees whose antennae had been removed and which had been rotated experienced great difficulty in getting home. Upon observing these insects at the start, it was seen that they are very uncertain in taking the direction to the hive. It seems very much as if on the field with no particular marks for orientation great difficulties arise for the bees as soon as a disturbance of their orienting system has taken place, and optical marks which could counterbalance the loss of the orientation to angles are relatively ineffective. When these experiments were repeated on an ordinary field, the results turned out to be exactly the same as in all the previous experiments.

The new knowledge here obtained brings us a little further in the analysis of the factors of orientation in the bee. The optic and the olfactory sense take part to a great extent; on the other hand, we now know that in addition an ability to register turns and angles described on a flight and related to a certain important optical mark is used for orientation. But there is still a long way to go before our picture becomes complete, because it will be necessary first to find out how many optical marks on a journey are necessary to attain an adequate degree of precision in orientation. New experiments of this kind will certainly be carried through in the future.

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LE COMPORTEMENT DES ABEILLES EN REVENANT À LA RUCHE

(Résumé)

L'analyse expérimentale des facteurs influençant et déterminant le comportement de certains insectes sociaux types en revenant chez eux, tels que les abeilles de ruche, n'a été basée que récemment sur des observations quantitatives. Plusieurs investigateurs, surtout von Frisch, ont montré que

l'excitation visuelle, l'odorat, et la manière dont celui-ci est au fond de la communication de l'excitation d'un individu à un autre, sont tous très importants. On montre que les abeilles semblent utiliser des signes visuels de l'environnement immédiat de la ruche pour l'orientation près de la ruche, et que l'effet de tels signes est très vite utilisé dans les situations nouvelles. On montre aussi que les abeilles peuvent utiliser les effets des tours et des angles faits ou pendant la volée ou pendant le transport dans une boîte fermée. Il y a de l'évidence que l'utilisation des tours est aidée par des organes situés dans les antennes. Ces conclusions sont basées sur des mesures étendues de la vitesse du retour à la ruche.

WOLF

DIE FÄHIGKEIT DER BIENEN, DEN HEIMWEG WIEDERZUFINDEN

(Referat)

Die experimentelle Untersuchung der Faktoren, die die Fähigkeit typisch sozialer Insekten, den Heimweg wiederzufinden, beeinflussen und bestimmen, wie zum Beispiel der Honigbienen, wurde erst seit kurzem auf quantitative Beobachtung fundiert. Es wurde von mehreren Forschern, insbesondere von Frisch gezeigt, dass visuelle Erregungen, Geruchssinn, und die Art und Weise, wie die letztere dem Austausch von Erregungen von einem Individuum zum andern dient, von allererster Bedeutung sind. Es wird gezeigt, dass Bienen offenbar Gebrauch machen von visuellen Zeichen der unmittelbaren Umgebung des Bienenstockes, und dass der Einfluss solcher Zeichen in neuen Situationen sehr schnell eingepägt wird. Es wird ferner gezeigt, dass Bienen die Fähigkeit haben, Eindrücke von Wendungen und Ecken einzuprägen, die sie auf dem Fluge oder auf dem Transport, eingeschlossen in einer Schachtel, machten. Es ist erwiesen, dass die Registrierung von Wendungen durch Organe in den Fühlhörnern vermittelt wird. Diese Schlussfolgerungen sind auf umfassende Messungen der Geschwindigkeit in der Rückkehr zum Stock basiert.

WOLF

SHORT ARTICLES AND NOTES

NOTE ON THE PSYCHOPATHOLOGY OF GENIUS

RALPH K. WHITE

Is genius characterized by mental disorder? Although Lombroso and others who have maintained this thesis are now pretty thoroughly discredited, perhaps the true issue has been clouded by the way in which the question has been put. Since neither genius nor mental disorder is a single entity, would it not be more accurate, and of more practical value, to ask: Are there any kinds of mental achievement which tend to be associated with pathological mental conditions? It may be, of course, that certain conditions, commonly called pathological, actually contribute to certain kinds of achievement. Liabilities to the individual, they may thus become assets to society. Or they may be a result of unnecessary conflicts between the gifted person and his social environment, and, as such, preventable. In either case, the question we have asked has a direct bearing on the education of gifted children.

Statistical evidence on this question is still extremely fragmentary and can be summed up in a few words. Let us, for the moment, lump all pathological conditions together and compare the different types of genius in regard to the amount of "psychopathy" they exhibit.

Havelock Ellis, in his 1030 British men of eminence, found 44 for whom insanity of some kind was reported. Of these, 31 were temporary, doubtful, or occurred only in old age, leaving 13 that were clearly insane for a large part of their lives. Of these 13, 6 were poets, 4 artists, 2 "men of letters," and 1 a business promoter. Taking all of the 44, including the 31 borderline cases, and distributing them among the different varieties of genius as classified by Ellis, we obtain the following ranking:

	"Insane"	Total	Ratio
Artists	7.5	83	.090±.023
Poets	7.5	110	.068±.018
"Men of Letters"	10.0	197	.056±.013
Scientists	4.0	120	.033±.013
Statesmen	4.0	126	.032±.012
Divines	4.0	138	.029±.011
Soldiers and sailors	2.0	83	.024±.013

The probable errors are large, of course, and the most we can say is that the first 3 may tend to be somewhat more psychopathic than the

last 4. There were no "insane" musicians, but the total number of British musicians (15), and of certain other groups, was too small to give significant statistics.

The present writer, in order to check these findings with a different group of subjects, studied the original data collected for Cox's book, *Early Mental Traits of Three Hundred Geniuses*. It amounted to an average of about 12 typewritten pages per man. He found 3 cases of confinement in asylums, for other than senile dementia (Cowper, Comte, and probably Tasso); 3 cases of drug addiction (Coleridge, Musset, and perhaps Haller); 3 cases of suicide (Chatterton, Clive, and Miller); and 4 cases of persistent hallucinations (Bunyan, Savonarola, Swedenborg, and Cardan). These are probably to be considered minimum figures, since the data are very inadequate. They give, curiously enough, 13 names which can be compared with Ellis' 13. The poets lead again with 5 names; there are also 3 religious leaders, 3 scientists, 1 philosopher, and 1 soldier.

The writer also arranged the 300 subjects in rank order, from the ones that exhibited clearly psychopathic traits down to the ones who were apparently extraordinarily sane, exhibiting (in their biographies) none of the little peculiarities and emotional conflicts which the average man may be assumed to possess. He then drew a line arbitrarily at the 75th percentile, so as to cut off the 75 cases nearest the psychopathic end of the distribution. These 75 cases are not to be considered "psychopathic," of course, in the common use of that word; they are simply somewhat less rational and serene than the average of the 300. It can be said, however, that the 75 names include every case for whom there was some reliable evidence of delusions, obsessions, temporary mental incapacity, marked moral instability, extreme melancholy, extreme emotional conflict, and the like, as well as many cases that were less extreme or for which the evidence was open to serious question. The following distribution of the 75 cases, although highly unreliable in regard to individuals, probably has some value in comparing types.

	Number included in 75 cases near- est the psycho- pathic end of the distribution	Total	Ratio
Revolutionary statesmen	5	8	.62±.13
Musicians	5	11	.45±.11
Novelists and dramatists	15	34	.44±.06
Poets	11	26	.42±.07
Religious leaders	9	22	.41±.08

Essayists and controversialists	7	20	.35±.08
Artists	3	13	.23±.09
Philosophers	4	22	.18±.06
Scholars	5	28	.17±.07
Scientists	6	38	.16±.06
Soldier-statesmen	1	11	.09±.07
Soldiers	2	25	.08±.04
Statesmen	2	42	.05±.03
Total	75	300	.25

Another line was then drawn at the 25th percentile, to cut off the 75 most well-balanced cases in a similar way. This group contains none of the revolutionary statesmen, but contains 3% of the novelists and dramatists, 8% of the poets, 18% of the musicians, 18% of the soldier-statesmen, 22% of the scholars, 23% of the philosophers, 24% of the religious leaders, 32% of the essayists, 36% of the soldiers, 38% of the artists, 38% of the statesmen, and 44% of the scientists.

As is to be expected when dealing with such small numbers, the rank order of the types of genius is highly unreliable. The artists, for example, are at the top of the list in the table based on Ellis' data, and below the middle in both lists based on Cox's data. But, in general, it seems that the aesthetic types tend to be more psychopathic than the scientific and practical types. The poets and novelists, in particular, are near the top pretty consistently, while soldiers and statesmen are consistently near the bottom. (Is this possibility due to the fact that the peculiarities of poets and novelists are more likely to be observed?) Perhaps we should expect that the reformer type, represented in revolutionary statesmen, and in Cox's "religious leaders" much more than in Ellis' "divines," would be significantly more psychopathic than the average. In this reformer type would be included such names as Marat, Mirabeau, Robespierre, Mazzini, Lamartine, Rousseau, St. Simon, Comte, Campanella, Calvin, Savonarola, George Fox, Swedenborg, and Bunyan, all of whom are said by some biographer or other to have possessed psychopathic traits.

There is even less evidence on the question as to the kinds of psychopathy associated with great achievement. Lombroso casts his net and drags in everything, from left-handedness and melancholy to precocity and longevity. Ellis mentions an unusual amount of stammering, physical awkwardness, gout, etc., as well as a surprisingly large number of imprisonments. Other writers use the anecdotal method almost exclusively. The only attempt to characterize types of genius statistically is apparently that of Cox, and this was done on a very small scale. Two raters gave each of 100 men selected from the original 300 a score on each of 67 character traits, all supposedly desirable. The scale consisted of scores

from minus 3 to plus 3, zero representing the assumed average of an unselected population. The group as a whole scored above zero in the great majority of the traits, and the same was true of the different types of genius considered separately. But in 2 traits which have a bearing on our question, "absence of occasional liability to extreme depression" and "absence of liability to anger," the group as a whole scored slightly below the assumed average. The group also averaged 1.2 in excitability, which was assumed to be a desirable trait. These 3 facts taken together may indicate that, in so far as psychopathy is to be found in genius at all, one of its forms is likely to be over-excitability. It may also be noted that 10 poets, 5 soldiers, and 12 philosophers all averaged above 2.0 in "introversion," which was also assumed to be a desirable trait.

On the basis of this and other evidence, three questions seem pertinent:

1) Does morbid introversion ever contribute to achievement in the field of imaginative writing? The fact that poets and novelists appear to be distinctly less well-balanced than the average of the other types of genius is interesting in connection with the fact that Cox's 10 poets averaged 2.1 in "introversion." It may be that the poet or novelist sometimes experiences thwarting or conflict in his external life and takes refuge in an inner world of "feeling" and imagination. Some such argument might be made in the cases of Coleridge, Lamb, Cowper, Shelley, Chatterton, Poe, Heine, Leopardi, Musset, Tasso, Herder, Rousseau, Chateaubriand, LaFontaine, Maupassant, Dostoievsky, Andersen, Goldsmith, Charlotte Brontë, George Eliot, and several others.

2) Does emotional excitability sometimes contribute to certain types of genius? It would not be surprising if the men who arouse the strongest emotions in others were often the ones who have the strongest, most unmanageable emotions themselves. This might apply to both the aesthetic and the reformer types, which have been mentioned as being less well-balanced than the others. It might also account for the fact that, in Cox's ratings, the poets, musicians, and revolutionary statesmen all average above 2.0 in "excitability."

3) Does fanatical self-confidence sometimes contribute to achievement in the fields of warfare, religion, and social reform? According to Cox, the one character trait that deserves to rank with intelligence as characteristic of genius is persistence. But persistence implies self-confidence, and self-confidence, when carried to the most extreme degree, becomes megalomania. Examples of extreme self-confidence in genius, and especially in what we have called the "reformer type," are legion: Mohammed, Joan of Arc, Savonarola, Luther, Cromwell, Napoleon, Murat, Robespierre, Marat, William Lloyd Garrison, Harriet Beecher Stowe, Florence Nightingale, Garibaldi, Nietzsche, and countless others.

In conclusion, we may say that there is need for more thorough study of the psychopathology of genius; that the aesthetic and reformer types deserve special attention; and that causal relationships may be looked for in connection with such traits as introversion, emotional excitability, and fanatical self-confidence.

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SOME TRAITS OF CERTAIN PERSONS ASSOCIATED WITH CARNIVAL ATTENDANCE

WAYNE DENNIS

The writer, in attempting to compare a carnival crowd with the general population of the same city, was faced with the problem of identifying the members of the carnival crowd. This problem is met in the attempt to study any crowd. The solution in this case has been only partially successful, for, although a definite group has been identified, this group was not the complete carnival group. It was, really, composed of those individuals who owned automobiles which were parked on the carnival grounds. But this group is interesting in itself, and the simple technique here suggested may be more applicable to other crowds than it is to carnival crowds.

The carnival ground under consideration is located 2.4 miles east of down-town Lansing, Michigan, and .4 of a mile beyond the city limits. It adjoins a city trolley line and an important inter-city highway. Ample free-parking space is provided.

At the carnival under study, over half of the crowd arrived by automobiles. Few autos arrived after 10 o'clock and few left before 10:30. During this half hour on Thursday, Friday, and Saturday nights, June 20, 21, and 22, the experimenter jotted down as many of the license numbers of the parked cars as he could. Approximately 150 per evening were obtained. As far as could be determined, these were a random sample of those present.

The persons owning these licenses were determined from the state automobile registration records. The names of the men thus found were sought in the city directory, and all not found there were discarded. One hundred and thirty-four remained. The few women who were found were not included in the study on account of the small number.

The canvass for the directory had been made approximately a year before the date of the carnival and it aimed to include all persons over 15 years of age. The carnival group was composed, therefore, of males

over 16 years of age who had resided in Lansing for at least a year and who were the owners of cars parked on the carnival grounds. It is entirely probable that many of these men had not accompanied their cars to the carnival.

The comparison group was a random sample of 200 taken from the city directory mentioned above. It included no members of the carnival group.

The data which were secured on these two groups were from the city directory, with the exception of the records of voting registration which were secured from the city clerk's office. The data are summarized in Table 1.

TABLE 1
COMPARISON OF CARNIVAL GROUP AND CHANCE GROUP

Bases of comparison	Percentages	
	Carnival	Chance
Telephone at residence	34	30
Married	63	66
Occupation		
Unskilled factory employees	67	57
Skilled workers	6	6
Salespeople	5	7
Professional	3	4
Proprietors and company officials	11	13
Students	2	3
Not employed	6	10
Rooming, not living at home	17	15
Registered for voting	30	37

None of the differences shown by the table is statistically reliable. The greatest differences, those between the percentages of factory employees and the percentages registered for voting, give values for

Diff.

$\frac{\sigma}{diff.}$

of 1.8 and 1.3, respectively.

The conclusion therefore is that, on the points concerning which we have information, the carnival group is indistinguishable from a random sample of the population as listed in the city directory.

The carnival chosen was one of the largest and best attended of the season. The weather was favorable. There were no unusual competing recreations.

It is felt that the identification of persons for study by copying or photographing automobile license plates is one which can be used to advantage in social psychology. Many aggregations of people are composed almost entirely of automobile owners whose cars are parked in

limited areas. To these the method is very suitable. Very often the members of these groups would be difficult to identify in any other way.

The use of data which can be secured without interviewing the subjects also has definite advantages. The sources are, of course, not limited to the two simple ones used here.

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REGISTRATION AND VOTING IN A PATRIOTIC ORGANIZATION

WAYNE DENNIS

Are the members of an organization which encourages civic activities superior to non-members in the performance of these activities?

This note reports a study of the registration and voting of the resident members for 1928 of the Lansing, Michigan, chapter of the Daughters of the American Revolution. This group is compared with two others. The first, the "chance group," is composed of a random sample of the women of voting age listed in the 1928 Lansing directory. The second, to be called the "neighbor group," was formed by selecting from the 1928 street directory the woman just preceding each D. A. R. member. The D. A. R.'s were 91 in number; the chance group totaled 200; and the neighbors, of course, 91.

New voting registration was required of all persons for participation in the 1928 elections, which were city, county, state, and national. Comparisons of the percentages registering, voting in primaries, and voting in November in the three groups were made by an examination of the records of the city clerk.

Of the chance group, 27% registered for voting; of the neighbor group, 55%; and of the D. A. R. group, 78 %. The difference between any two of these percentages is reliable.

Among those who had registered, the following voted in the primary election: chance group, 48%; neighbor group, 62%; D. A. R. group, 70%. Only the difference between the first and the last groups is reliable.

Considering again only those women who had registered, we obtain the following results for the November election: chance group, 90%; neighbor group, 90%; D. A. R. group, 87%. No reliable differences exist here.

The facts then are these: The D. A. R.'s registered and voted in both elections to a reliably greater extent than did either their nearest directory neighbors or a group of the directory women at large. Similarly, the neighbors exceeded the chance group. If we restrict our voting com-

parisons to those who registered, the same relations hold for the primary that hold for registration, but no differences are found in regard to the November election.

These results can be stated in terms of voting strength, the term being self-explanatory. The voting strength of the D. A. R. is much greater than that of an equal-sized group of the average population. A group of superior social status has a greater voting strength than a group of the same size from the population at large, but less than a numerically equivalent group of D. A. R.'s.

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THE SMALL FAMILIES OF LARGE-FAMILY ADVOCATES

RAYMOND R. WILLOUGHBY

It is a standard, and of course an unexceptionable, contention of eugenists that the fitter members of any group have a social obligation to maintain and if possible advance the proportion of their germ-plasm in the general population. It may be interesting to learn to what extent the fitter eugenists are fulfilling this obligation.

The letter-head of the American Eugenics Society contains the names of the officers and advisory council of the Society, totaling 118 persons officially sponsoring the eugenic program. Ninety-eight of these are personally listed in *Who's Who*, and the number of children of two more women may be obtained from that volume through the fact that their husbands are included. The following is the distribution of children so reported; no deduction is made for deceased children, of whom there were approximately a dozen, since we do not know whether they died before reproducing.

Children	0	1	2	3	4	5	6	7	8	9
Frequency	34	9	17	19	8	10	1	0	1	1

The mean number of children reported per eugenist is thus 2.05, which by reason of mortality falls below the maintenance level. This figure may be compared with 2.8,¹ the corresponding value for all individuals listed in *Who's Who*.

There seems no reason to suspect these individuals or their mates of either insincerity or of biological or economic inadequacy. It is suggested that the causes of the general phenomenon of negative correlation be-

¹Males, completed families; the two values are not strictly, but probably roughly comparable.

tween fertility and social adequacy lie far deeper than the naïve forms of the eugenic doctrine have yet considered—e.g., in the obscure but important regions concerned with the economics of libido—and that the whole relation between psychology and genetics badly needs careful examination.

Clark University

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BOOKS

SELIGMAN, E. R. A. [ED.] *Encyclopaedia of the Social Sciences*. Vol. I: Aar-All. (15 vols. in the series.) New York: Macmillan, 1930. Pp. xxvii+646. \$7.50.*

1. HISTORY OF THE ENCYCLOPAEDIA. It is only in comparatively recent years that the interdependence of the social sciences has come to be recognized as a concept necessary to their progress. The older sciences had such a great mass of phenomena to arrange and to interpret that each of them was busy in pursuing its own problems. The newer sciences found enough to do in staking out their respective fields and in vindicating their claims to existence as separate disciplines. The result was that all the sciences continued in water-tight compartments and it was thought that the greatest progress could be made by emphasizing differences rather than similarities. There was in truth much to be said for this point of view in the early years of development; but there has come a slow realization that, while there are all kinds of associations and many angles from which human contacts can profitably be studied, it is a mistake to separate them permanently into independent sections. The sentient being is after all a whole; it is unwarrantable to hold that any one phase of his activity is completely divorced from the others. Especially is this true when we consider the relation of the individual to the group and endeavor to comprehend the subtle influences reciprocally exerted by the various manifestations of common activity. The *conclusions* reached by the separate sciences were gradually recognized, therefore, as incomplete and provisional, and the demand went forth to attempt a better analysis through a more comprehensive synthesis.

It was in pursuit of this purpose that after many abortive attempts and premature efforts a movement of real vitality was initiated. In the year 1923 Dr. Alexander Goldenweiser and Dr. Howard B. Woolston of the American Sociological Society sponsored a resolution designed to lead that association to consider whether the time might not have come to attempt some united action in this general direction. In the following year, as the result of the efforts of the above gentlemen and Professor W. F. Ogburn, six of the other leading learned societies in the field of social science ap-

*The publishers, the Macmillan Company, have extended permission to *The Journal of Social Psychology* to print as a book review this material by Professor Seligman which has appeared as a general editorial preface in Volume I of the *Encyclopaedia of the Social Sciences*. The Series is so important and has behind it so many resources and so much organization that it has seemed that no other review of the Series would be adequate.

EDITOR.

pointed committees to consider the suggestion. An energetic campaign to enlist the interest of a wide range of scholars was carried on by Dr. Goldenweiser.

A Joint Committee, consisting of three representatives of each association, held several meetings during 1925 and discussed the various possibilities from every point of view. The result of its deliberations was the recommendation that there be undertaken some comprehensive and unifying publication. The task of working out the details of the plan was entrusted to an executive committee of which the subsequent editor-in-chief was made chairman. After much discussion it was resolved to give effect to the ideas of the Joint Committee by the launching of an encyclopaedia.

During the early months of 1926 the report was adopted by each of the cooperating societies and was also approved by the Social Science Research Council. Moreover the report was sent to a small list of distinguished scholars in the various fields concerned in order to elicit their opinions as to the feasibility of the project. Uniformly favorable replies were received. These letters were printed in the Memorandum on the Projected Encyclopaedia of the Social Sciences published in 1927.

The executive committee then asked the chairman to serve as editor-in-chief. After much hesitation, due to his appreciation of the responsibility involved, he accepted the invitation, and devoted the next twelve months to the collection of the necessary funds and to the elaboration of the plan. By the spring of 1927 these two objectives had been attained, and in May of that year the Joint Committee was reconvened. At this meeting the number of constituent societies was increased to ten. The sponsors of the Encyclopaedia are thus the following:

American Anthropological Association
American Association of Social Workers
American Economic Association
American Historical Association
American Political Science Association
American Psychological Association
American Sociological Society
American Statistical Association
Association of American Law Schools
National Education Association

The time had then come for the definite organization of the enterprise. The first point was the selection of the staff. After much deliberation the editor-in-chief prevailed upon Dr. Alvin Johnson to become associate editor. Assistants well trained in the various sciences were chosen to take charge of the different fields of work and their number was increased from time to time as occasion demanded. Their names appear on the title page. Acknowledgment should also be made of the help accorded by Dr. Helen Sumner Woodbury, Miss Gladys Boone, Dr. Benjamin Ginzburg, Dr. Gustav Peck and Dr. Alexander Goldenweiser, who at various times were

members of the editorial staff. The next point was the provision for the business end of the project. The enterprise was incorporated as Encyclopaedia of Social Sciences, Inc., and the corporation was composed of the Joint Committee. The Board of Directors consists of twenty-one members, eight lay and thirteen academic, the latter being selected by the constituent societies.

During the summer of 1927 the editor-in-chief went abroad in order to enlist the support of the leading European scholars. In the course of a trip which included virtually all of the important universities from Oslo to Florence, he conferred with hundreds of the most distinguished scholars scattered throughout Europe. He was both astonished and heartened by the enthusiasm that was manifested on all sides, and by the readiness of virtually everyone to lend his hearty cooperation in what was recognized to be not only a gigantic project but one which would be of great importance to the progress of the social sciences throughout the world.

In the autumn of 1927 provision was made for the selection of a board of Advisory Editors. The members of this board were chosen by the editor-in-chief and number seventeen Americans and eleven foreigners. The advisory editors have been heavily drawn upon for constant advice and criticism, and deserve this entirely inadequate word of appreciation for their admirable services. They are not to be held responsible, however, either for the particular articles or for the selection of specific contributors. The responsibility for these matters attaches entirely to the editorial staff.

The Encyclopaedia has suffered an irreparable loss in the death of one of its advisory editors, Leonard T. Hobhouse. He placed his wealth of learning and catholicity of mind most generously at the service of the editors and they will find many occasions in the further development of the work where his advice would have been invaluable.

As the work progressed it became evident that much help would be needed by the editorial staff, in addition to that given by the advisory editors. The field covered by the Encyclopaedia was in large part so untrodden that it was resolved to enlist the aid of several hundred scholars, both here and abroad, to each of whom were referred all manner of queries as to special points falling within their competence. These specialists, whom we have designated as Editorial Consultants, have served without compensation, and to them is in large measure due whatever credit we may have earned in the difficult matter of selection and organization of material.

It had been originally intended to publish the Encyclopaedia in ten volumes. It was soon found, however, that this would necessitate either undue bulk or inordinately thin paper, so that it was finally decided to issue the work in fifteen volumes. The first volume, appearing now, will be followed in regular sequence at the rate of three volumes a year.

II. SCOPE, METHODS AND AIMS OF THE ENCYCLOPAEDIA.

The Encyclopaedia includes, in the first place, all of the purely social sciences as they are described in the first section of the introduction. Obviously, however, it can not go so much into detail as would be possible for a series of works dealing with each separate science. Intensive treatment of this kind would be inappropriate because the real object of the Encyclopaedia is not so much to exhaust each particular subject as to bring out in the respective topics the relations of each science to all of the other relevant disciplines. Accordingly we endeavor to include all of the important topics in politics, economics, law, anthropology, sociology, penology and social work. With the technique of these subjects we obviously have to be more brief. A subject such as history is represented only to the extent that historical episodes or methods are of especial importance to the student of society.

In the case of what we have designated in the introduction as semi-social sciences—ethics, education, philosophy, and psychology—it becomes necessary to select those topics of which the social aspects are acquiring increasing significance. This is still more true of what we have called the sciences with social implications, like biology and geography on the one hand, and medicine, philology and art on the other. It is, however, precisely the social aspects of these sciences which have come to the front in recent years and which it is especially important to emphasize. The proper treatment of the more or less outlying fields which have never yet been comprised under the head of social sciences, but which it now becomes necessary or at all events desirable to include, is one of the most difficult questions that has confronted the editors. Moreover the requirements of a work which seeks to coordinate the various social sciences and to indicate their relations to the general movement of thought involve the inclusion of many topics not usually treated in the special encyclopaedias.

In considering whether the Encyclopaedia should be primarily a dictionary or, as is customary in Germany, primarily a handbook, the decision has been reached that it ought to combine the characteristics of both. This means that the alphabetical method is followed, but that the arrangement is so flexible as to contain not only short articles of a few lines or paragraphs but also longer articles of ten or twenty thousand words, which will permit of thoroughgoing and original contributions. A carefully worked out system of cross references will enable the student with a special interest to cover thoroughly any part of the field.

It has also been decided to include biographies of deceased persons whose work has been significant in the various sciences in question. As this list will comprise many names hitherto unnoted, it has become necessary to make the typical biography very brief and to allow a longer treatment only in extraordinarily important cases. Even thus, the space allotted to biographies covers about one fifth of the entire contents.

For the sake of giving unity to the work it has been decided, largely at the suggestion of Dr. Goldenweiser, to equip it with an extended introduction, which appears in this first volume. This introduction, as will be noted, is arranged in two main divisions. In the first are a discussion of the meaning of the social sciences and a history of their development arranged according to periods. It is designed to exhibit as far as may be in non-controversial fashion the filiation of the social sciences and their contemporaneous relationship, as well as their dependence on the institutional and general intellectual situation. The second division of the introduction is an account of the social sciences as disciplines, in their historical development, throughout the world. In the final volume it is proposed to include a rigorously selected and annotated bibliography covering the works of primary importance in the development of the social sciences.

The special character of the Encyclopaedia has necessitated methods of approach which are not customary in works devoted to the separate sciences. The first task was to assemble a list of topics for the entire work, to form tentative plans for the treatment of each topic and to assign it a space valuation. As a preliminary to this it was necessary to make a systematic analysis of each science or of each section of a science, such as the labor problem or government, and to organize this material into topics suitable for encyclopaedia treatment. A survey was made of all the existing reference books in order to note the topics treated, the methods of treatment, the relation to other topics and the allocation of space. On the basis of such data the staff prepared cards indicating the character of the article needed, the space assigned and the probable cross references. By comparison of the various topics we were able to determine how adequately each group covered its part of the field.

At the outset we classified our material as falling under the several sciences, economics, social psychology, etc., and tried to discover some rule of proportion for the distribution of space. In the actual presence of the material, classification and apportionment lost their definiteness and rigidity. Such a topic as wages, for example, may be classified as economic, but the treatment must involve the use of statistical, historical and sociological methods. David Hume may be accredited to philosophy, but he is very important for political science and economics. Psychological methods have to be employed widely in political, social and economic topics. When the Encyclopaedia has been completed, it is safe to say, no one will be able to determine what proportion of the total space has gone to one science, what proportion to another. We are trying to give each topic, wherever it falls, as adequate space as its importance and the nature of the material demand. This does not mean that the space assignment is indicative of the importance attached to the various subjects. Some very important topics can be treated adequately in relatively brief space, as, for example, the doctrine of sovereignty, which has been refined down to clear-cut principles.

Such a topic as housing, on the other hand, involves a great deal of specific material and requires much more space in relation to its absolute importance.

When a provisional list of topics within each field was completed it was circulated for comment and criticism among the editorial consultants. After noting their suggestions the staff prepared an outline of the contents of each article. This outline was sent to the contributor, with the object not of limiting his freedom in any way but of pointing out our own conception of how the article would best fit into the general plan. The labor involved in this method of work has been prodigious, but the results, we hope, will prove correspondingly satisfactory.

In the history of encyclopaedia making, the problem of composition has been handled in three ways: the bulk of the work has been done by the staff; it has been assigned in large sections to editorial contributors who have sublet the actual composition to others; it has been distributed widely, each assignment being made directly from the central office. We have followed the last method, for two principal reasons. First, the importance of our enterprise consists not only in its result but also in the process of its making. Those who collaborate with the staff in preparing the Encyclopaedia will join us in thinking through many of the problems of the relations of the sciences and of the evolution of social scientific ideas. The more we succeed in securing the cooperation of the whole body of social scientists, the greater the value to social science of the work of preparing the Encyclopaedia. Second, by distributing the work widely with especial attention to the interests of each contributor, we are justified in expecting each article to be executed according to the best ability of the writer.

In speaking of our contributors we desire to emphasize the international aspect of the enterprise. It is true that since the work is written in English the great mass of our contributors are English speaking and, since the inception of the project and its management are within the United States, the Encyclopaedia may in one sense be regarded as an American enterprise. It would be a great mistake, however, to consider it as merely a national product. Our policy has been in every case to select the scholar best fitted to write the particular article. Where we find an American of equal competence with a foreigner, we give him the preference, chiefly on the score of convenience. But whenever, as frequently happens, the scholar who is indisputably best qualified for that particular topic happens to be a foreigner, we assign the article to him. In order to afford them the fullest measure of opportunity we have asked our foreign contributors to write in their own language. Therefore articles by foreigners, with the rarest exceptions, have been translated by our staff, so that the contributor must be held responsible only for the content, not for the form.

In the making of the Encyclopaedia we have had three purposes in mind. In the first place it is intended to provide for the scholar a synopsis of the progress that has been made in the various fields of social science in the broadest sense of the term. The student of any particular science should not only find here factual and methodological information of value, but will also have his attention called, perhaps in a hitherto unusual way, to

the relation of his own science to the other disciplines involved. What is probably more important at this time, when such rapid advance is being made in more or less untrodden paths, the Encyclopaedia may be expected to serve as an incentive to the votaries of the younger and more inchoate sciences in order to bring to fruition what is now only in germ.

Secondly, the Encyclopaedia will, it is hoped, appeal to a much more numerous class which for lack of a better term might be called the intelligentsia in the various countries. It ought to furnish an assemblage or repository of facts and principles which will subserve the interests of all those who are keeping abreast of recent investigation and accomplishment. It is for this reason that we have made every effort to keep the articles free from all scientific jargon.

Finally, amid the welter and confusion of modern thought, it has been our hope that the Encyclopaedia would constitute a center of authoritative knowledge for the creation of a sounder and more informed public opinion on the major questions which lie at the foundation of social progress and world development.

EDWIN R. A. SELIGMAN,
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INTELLIGENCE AND BIRTH ORDER IN FAMILY*

From the Psychological Laboratories of the University of Chicago

MINNIE LOUISE STECKEL

STATEMENT OF THE PROBLEM

The object of this study was to discover, if possible, any relationship which might exist between intelligence of children and their birth order.

A parallel study of the problem was made by L. L. Thurstone, University of Chicago, and Richard L. Jenkins, Illinois Institute for Juvenile Research, based upon the data of the Institute population. The records at the Institute are largely of retarded children of foreign-born parentage. The records of the Stanford-Binet examination were used in the study at the Institute.¹

The data upon which this study is based were obtained from children enrolled in the public schools at Sioux City, Iowa, during the years, 1926-1928, from Grade 1 to Grade 12, inclusive. During this period tests were given to approximately 20,000 children. Because of the large number of children tested, obviously, it was necessary to use group tests.

The study covers a wide range of intelligence. It was necessary, therefore, to use four different group intelligence tests. The tests used for the various grades were as follows:

Tests	Grades
Kuhlmann-Anderson	Jr. 1 to Jr. 3
National	Sr. 3 to Sr. 4
Otis Intermediate	Jr. 5 to Sr. 8
Otis Advanced	Jr. 9 to Sr. 12

Only the grade in which the child happened to be placed determined which test he would take.

*Received for publication by L. L. Thurstone of the Editorial Board, October 7, 1929.

¹It was at the suggestion and under the direction of L. L. Thurstone that this study was made along similar lines on a large population of normal children of a more or less typical community. The present study was made in partial fulfillment of the requirements for the Degree of Doctor of Philosophy at the University of Chicago.

The tests were given by the writer and an assistant after a uniform mode of procedure had been established. The scoring of the tests and the tabulation of the results were done by two experienced scoring clerks.

Questionnaires were sent to the parents asking them for the names and ages of all their children, including records of any children who had died. No attempt was made to obtain a record of miscarriages. The questionnaires were sent home by the children and returned in like manner. An effort was made not to associate the test with the questionnaire, although the questionnaires were always sent out two or three days following the testing of the children of any particular school.

The questionnaire data and the test results were recorded for the children of each family. In grouping by families, it was necessary to discard the record of any child on which either the test data or the questionnaire were lacking. Also only the records of those children were retained for which there were data also for a brother or sister up to the eighth-born child. Thus only the data of siblings were used in the present study.

There were data for one or both of approximately 150 pairs of twins. These data, as well as the records of step-siblings, were not included in the study for they would tend to bring in additional variables not included in the regular sibling data.

The intelligence quotients as obtained by each of the tests were translated into their equivalent standard scores. The constant 5.00 was added to these scores to avoid negative values. By using the intelligence quotient upon which to base the calculations rather than the raw score, there is obtained a measure which is uncorrelated with age. The computation of standard scores for each test eliminates the possibility of differences which might arise due to the relative difficulty of the scale at the various age levels.

Table 1 gives the number and sex of children for each birth order.

TABLE 1
NUMBER OF CHILDREN FOR EACH BIRTH ORDER

	1st Born	2nd Born	3rd Born	4th Born	5th Born	6th Born	7th Born	8th Born	Total
Male	838	962	675	412	212	146	90	46	3,381
Female	821	1012	637	378	232	148	86	45	3,409
Total	1659	1974	1312	790	494	294	176	91	6,790

The total number of individual children, 6,790, group themselves into 5,928 pairs of siblings. The total number of families represented is 2,712. These include 1,864 families of which both parents are American-born and 602 families of which both parents are foreign-born. They include also 164 families of which the mothers are American-born but the fathers are foreign-born and 82 families of which the fathers are American-born but the mothers are foreign-born. The study is limited to the Caucasian race. Both sexes are about equally represented. The age range covers from year 5 to year 21. The range of intelligence is from 50 to 165 points *I.Q.*

Sioux City is located on the Missouri River, directly north of Omaha, Nebraska. Its population is estimated at 86,000. There are no slums or tenement districts. There is evidently nothing inherent in the general population which might bias the results of the study.

With so large a sampling, the selection of which was entirely dependent upon the willingness of parents to answer a questionnaire, the fact that it is a sampling of a school population should, when handled statistically, not bias the results.

ANALYSIS OF THE DATA

In Table 2, of which Figure 1 is the graphical representation, are given the mean standard scores for each birth order up to and including eighth-born children.

TABLE 2
MEAN STANDARD SCORE FOR EACH BIRTH ORDER

Birth Order	1	2	3	4	5	6	7	8
Mean standard score	5.1	5.1	5.1	5.1	5.0	4.9	4.8	5.0
Number of children	1659	1974	1312	790	494	294	176	91

This analysis would indicate that there is very little difference between the mean intelligence of the various ordinal groups. The earlier-born children appear to have a slightly higher intelligence. It is, however, a well-known fact that the lower socio-economic classes have larger families and that on the average the children of larger families have lower intelligence quotients. There is, as indicated in Table 2, a preponderance of smaller families. These two

factors, the preponderance of smaller families and the lower intelligence of large families, obscure the correlation we are investigating, i.e., intelligence and ordinal number.

In order to control size of family and the socio-economic factors, the records were paired so that with the record of each first-born child there is compared the record of the second-born sibling; with the record of each second-born child there is compared the record of the third-born sibling, etc., up to the eighth-born children. In this method of comparing ordinal groups, a family is represented equally often in each comparison group and thus the comparison is made between members of the same family. Since in a school population it is possible often to secure records of a child and one sibling but not of other siblings, the records that were available were grouped according to their ordinal number. The mean standard score for each group of each pair was computed and their difference indicated as in Table 3.

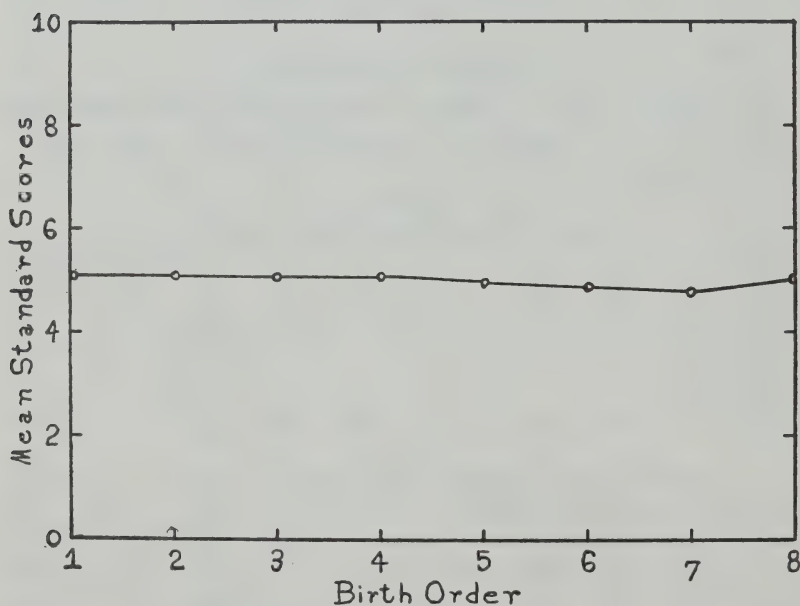


FIGURE 1
MEAN STANDARD SCORES FOR EACH BIRTH ORDER

TABLE 3
DIFFERENCE BETWEEN THE MEAN STANDARD SCORES OF VARIOUS ORDINAL GROUPS

Number of families	M_8	M_7	M_6	M_5	M_4	M_3	M_2	M_1	Difference
1523							5.2877	-5.1869	.1008
665						5.2850		-5.0639	.2211
235					5.3213			-5.0149	.3064
69				5.0986				-4.9174	.1812
24			5.2208					-4.8250	.3958
4		5.0750						-4.7000	.3750
1	5.7000							-4.7000	1.0000
946						5.2185	-5.0652		.1533
376					5.2399		-4.9673		.2726
129				5.0953			-4.8124		.2829
39			5.1359				-4.6487		.4872
9		4.9222					-4.4778		.4444
0	no data						no data		no data
544					5.1669	-4.9877			.1792
201				5.1080		-4.8542			.2538
71			5.0873			-4.5732			.5141
21		5.2238				-4.5333			.6905
5	5.2000					-4.5000			.7000
328				5.0872	-5.0034				.0838
113			5.0717		-4.8814				.1903
44		5.1545			-4.9614				.1931
14	5.1643				-4.7714				.3929
197			4.9690	-4.8320					.1370
85		5.0706		-4.8706					.2000
30	5.1667			-4.8000					.3667
125		5.0000	-4.7840						.2160
51	5.0529		-4.6706						.3823
79	5.0734	-4.9848							.0886

The first column indicates the number of families represented in each ordinal group. The notation, M_8 , M_7 , M_6 , etc., indicates the mean standard score of the ordinal group in the column with that subscript. In the last column are recorded the differences between the mean standard scores of the various ordinal groups, as indicated. The notation is:

$$M_2 - M_1 = d_{21}$$

In which M_2 is the mean standard score of second-born children and M_1 the mean standard score of their first-born siblings; and d_{21} is the difference between the mean standard scores of the two groups indicated, or more generally

$$M_a - M_k = d_{ak}$$

Thus the mean standard score for each possible pairing of ordinal numbers is recorded and their difference indicated.

A very remarkable fact is that in the entire table there are no inversions. All differences are in favor of the group of later-born children. It was thought at first that it might be an artifact due to the manner in which the data had been handled. A careful check does not reveal that such is the case. Since the study is so extensive in scope, the tabulations were made by a Power's automatic sorting machine. The data were punched directly from the printed record cards upon the Power's cards and sorted into ordinal groups and distributions by an experienced Power's machines operator. The handling of the record cards previously was done almost entirely by clerks and by teachers in Sioux City Schools, who at the time were not aware of the fact that the work was for any purpose other than those of the regular plan of any testing program in a public school system.

Table 4 shows the differences between the mean standard scores of the first-born children and the mean standard score of the second-born children, the mean standard score of first-born children and third-born children, the mean standard score of the first-born and fourth-born children, i.e., Table 4 is a summary of the differences between the mean standard scores for all comparison groups up to and including fourth-born children.

TABLE 4
DIFFERENCES IN MEAN STANDARD SCORE FOR THE FIRST FOUR
ORDINAL NUMBERS

		Birth Order			
		1	2	3	4
Birth Order	1		.1008	.2211	.3064
	2	— .1008		.1533	.2726
	3	— .2211	— .1533		.1792
	4	— .3064	— .2726	— .1792	

These differences, as indicated in Table 4, are the differences from a direct comparison of 12 ordinal groups. A combination of these differences, so that there are obtained the differences between the mean standard scores for the first-born and second-born, for the second-born and third-born, and for the third-born and fourth-born, is computed in the following manner.

Indicating the direct differences by d , the indirect differences by d' , the formula is stated as follows:

$$d_{ak} - d_{bk} = d'_{ab}$$

in which d_{ak} and d_{bk} are the direct differences of the ordinal numbers indicated in the subscripts. The differences are thus calculated between the values in adjacent columns which are summed and the

means computed, i.e., $\frac{\Sigma d'_{ab}}{N} = D_{ab}$; in which D_{ab} is the calculated

difference between the two ordinal groups in question. For example, the following equations are solved for Columns 1 and 2 of Table 4:

$$d_{21} - d_{11} = d'_{12}$$

$$d_{22} - d_{12} = d'_{12}$$

$$d_{23} - d_{13} = d'_{12}$$

$$d_{24} - d_{14} = d'_{12}$$

$$\text{then } \frac{\Sigma d'_{12}}{4} = D_{12}$$

By this method there is obtained a very good approximation of the difference between the first-born and second-born if the data were complete for all families. All differences between the four ordinal groups are computed in this manner. There is a duplication in the first two items of each series due to the fact that $d_{11}=0$, $d_{22}=0$

$$\text{then } d_{21} - d_{11} = d_{12}$$

$$d_{22} - d_{12} = d_{12}$$

These two items have double weight, but, since they amount to direct comparison, this duplication has been considered justifiable.

The differences computed from the values in Table 4 are as follows:

Successive differences	Accumulative differences
1 — 1 = 0	1 — 1 = 0
2 — 1 = .08	2 — 1 = .08
3 — 2 = .13	3 — 1 = .21
4 — 3 = .14	4 — 1 = .35

The accumulative differences are shown in Figure 2.

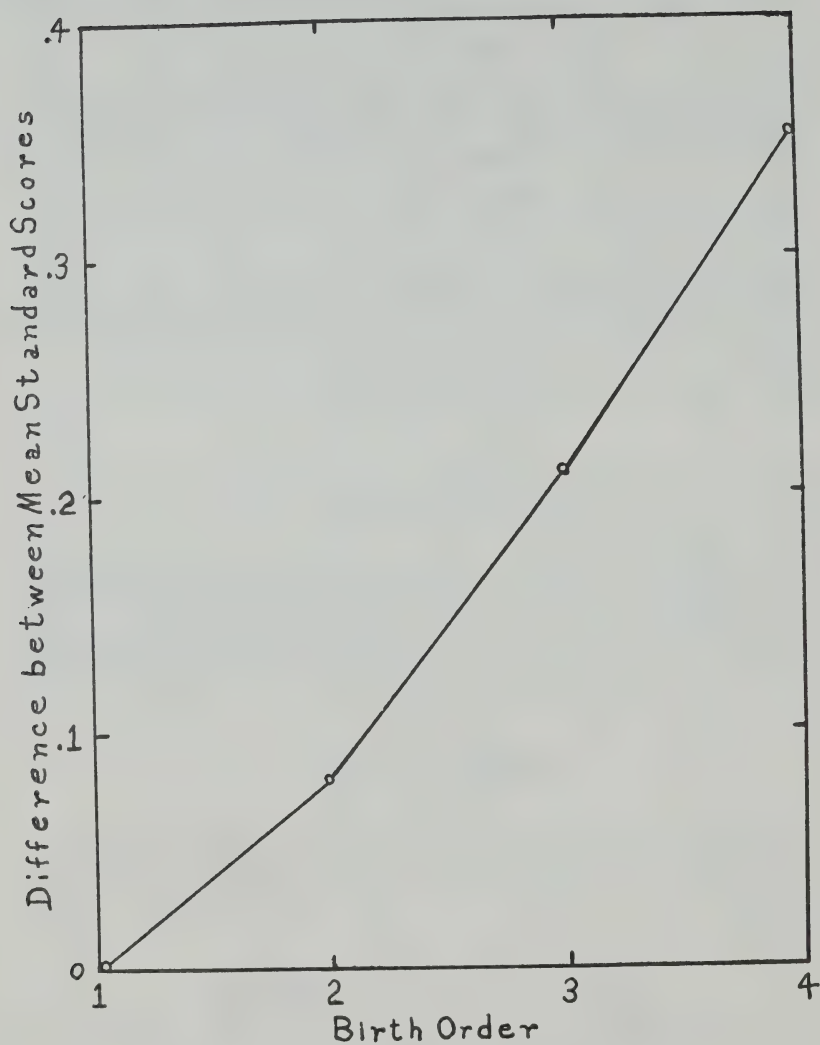


FIGURE 2

DIFFERENCES BETWEEN MEAN STANDARD SCORES, FIRST FOUR ORDINAL NUMBERS

In Table 5 are tabulated the differences for all possible combinations of comparison groups up to and including eighth-born children.

TABLE 5

DIFFERENCES BETWEEN MEAN STANDARD SCORES FOR THE FIRST EIGHT ORDINAL NUMBERS

	Birth Order							
	1	2	3	4	5	6	7	8
1	.0000	.1008	.2211	.3064	.1812	.3958	.3750	1.0000
2	— .1008	.0000	.1533	.2726	.2829	.4872	.4444	no data
3	— .2211	— .1533	.0000	.1792	.2538	.5141	.6905	.7000
4	— .3064	— .2726	— .1792	.0000	.0838	.1903	.1931	.3929
5	— .1812	— .2829	— .2538	— .0838	.0000	.1370	.2000	.3667
6	— .3958	— .4872	— .5141	— .1903	— .1370	.0000	.2160	.3823
7	— .3750	— .4444	— .6905	— .1931	— .2000	— .2160	.0000	.0886
8	— 1.0000	no data	— .7000	— .3929	— .3667	— .3823	— .0886	.0000

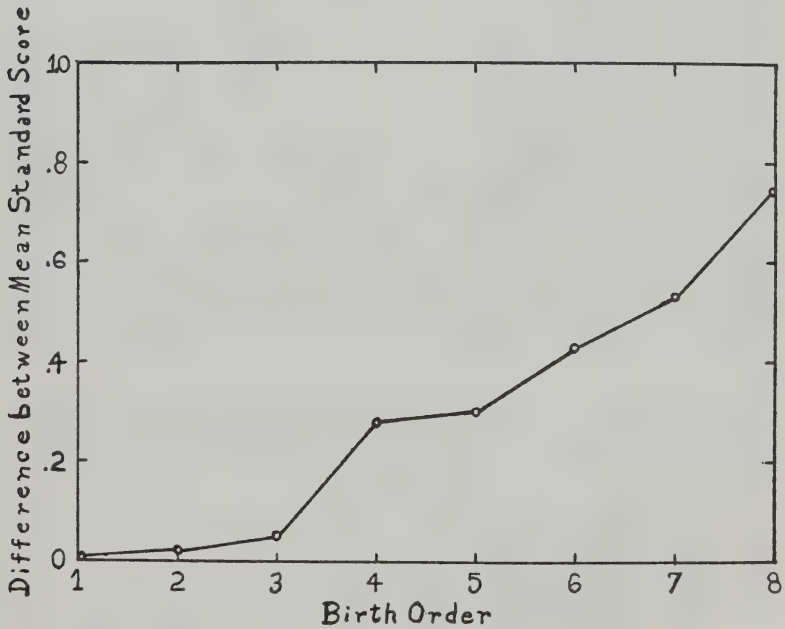


FIGURE 3

DIFFERENCE BETWEEN MEAN STANDARD SCORES, FIRST EIGHT ORDINAL NUMBERS

The same computations were made for these 28 observation equations as were made for the data in Table 4. The results are as follows:

Successive differences	Accumulative differences
$d_1 - d_1 = .000$	$d_1 - d_1 = .030$
$d_2 - d_1 = .006$	$d_2 - d_1 = .006$
$d_3 - d_2 = .039$	$d_3 - d_1 = .045$
$d_4 - d_3 = .233$	$d_4 - d_1 = .278$
$d_5 - d_4 = .025$	$d_5 - d_1 = .303$
$d_6 - d_5 = .129$	$d_6 - d_1 = .432$
$d_7 - d_6 = .113$	$d_7 - d_1 = .545$
$d_8 - d_7 = .192$	$d_8 - d_1 = .737$

The accumulative differences are represented graphically in Figure 3. As the ordinal number increases, the difference between mean standard scores from the first-born steadily increases until the difference between the first-born and eighth-born is .74.

Obviously, there must always be a first-born child in every family of children, and the greater the ordinal number the fewer representatives there will be for that ordinal number. It is impossible, therefore, to obtain as many records for later-born children as for earlier-born children. For the 28 observation equations tabulated in Table 5, the group representation varies from 1,523 families representing the first-born and second-born children to one family representing the first-born and eighth-born children. In the computation of differences between mean standard scores of the various ordinal groups, the differences established by a very small number of families are given equal weight with differences established by a very

TABLE 6
DIFFERENCES BETWEEN MEAN STANDARD SCORES FOR THE FIRST EIGHT
ORDINAL NUMBERS: NO ITEM ESTABLISHED BY LESS THAN FIFTY FAMILIES

		Birth Order							
		1	2	3	4	5	6	7	8
Birth Order	1	.0000	.1008	.2211	.3064	.1812			
	2	— .1008	.0000	.1533	.2726	.2829			
	3	— .2211	— .1533	.0000	.1792	.2538	.5141		
	4	— .3064	— .2726	— .1792	.0000	.0838	.1903		
	5	— .1812	— .2829	— .2538	— .0838	.0000	.1370	.2000	
	6			— .5141	— .1903	— .1370	.0000	.2160	.3823
	7					— .2000	— .2160	.0000	.0886
	8						— .3823	— .0886	.0000

large number of families. This gives too much weight to the differences established by the smaller groups and too little weight to differences established by the larger groups. The observation equations, therefore, vary in reliability depending on the number of families represented in each.

Table 6 shows only those observation equations which are established by no less than 50 families. When those differences which were established by a very few families are eliminated, the relative differences between the various ordinal groups should be nearer the true value.

The results of this solution are as follows:

Successive differences	Accumulative differences
$d_1 - d_1 = .0$	$d_1 - d_1 = .0$
$d_2 - d_1 = .040$	$d_2 - d_1 = .040$
$d_3 - d_2 = .110$	$d_3 - d_1 = .150$
$d_4 - d_3 = .176$	$d_4 - d_1 = .326$
$d_5 - d_4 = .030$	$d_5 - d_1 = .356$
$d_6 - d_5 = .032$	$d_6 - d_1 = .388$
$d_7 - d_6 = .197$	$d_7 - d_1 = .585$
$d_8 - d_7 = .114$	$d_8 - d_1 = .699$

A comparison of the accumulative differences of this solution with the accumulative differences of the solution in which all 28 observation equations are used, regardless of the number of families by which each observation equation is established, shows that the increment in mean intelligence from the first birth order to each successively higher birth order is increased for the earlier birth orders although the final difference between the first-born and eighth-born is less than in the former solution.

In the next solution, all 28 observation equations have been used, but each equation is weighted according to the number of families for each pair of ordinal numbers. That is, the weight of each observation equation is the number of families it represents. In this solution, from the 28 observation equations tabulated in Table 5, there were derived seven normal equations, and with the mean standard score of the first-born children as an origin, the mean standard score for each of the ordinal groups was calculated by the method of least squares.

The successive differences obtained by this calculation are as follows:

$$\begin{aligned}
 M_1 - M_1 &= .0 \\
 M_2 - M_1 &= .09 \\
 M_3 - M_1 &= .23 \\
 M_4 - M_1 &= .39 \\
 M_5 - M_1 &= .46 \\
 M_6 - M_1 &= .58 \\
 M_7 - M_1 &= .75 \\
 M_8 - M_1 &= .87
 \end{aligned}$$

The object of this solution, in addition to establishing the fact of differences and direction of those differences, is to disclose, if possible, some general law or tendency, independent of accidental variation, which might be operative in the distribution plotted from the observed data. As is shown in Figure 4, it is apparent that the mean intelligence rises with birth order. This increase continues even to the eighth-born children. Whether the intelligence would continue to rise indefinitely with each ordinal number is an interesting speculation. It is conceivable that beyond a certain point the age and exhaustion of the parents might be detrimental influences for the

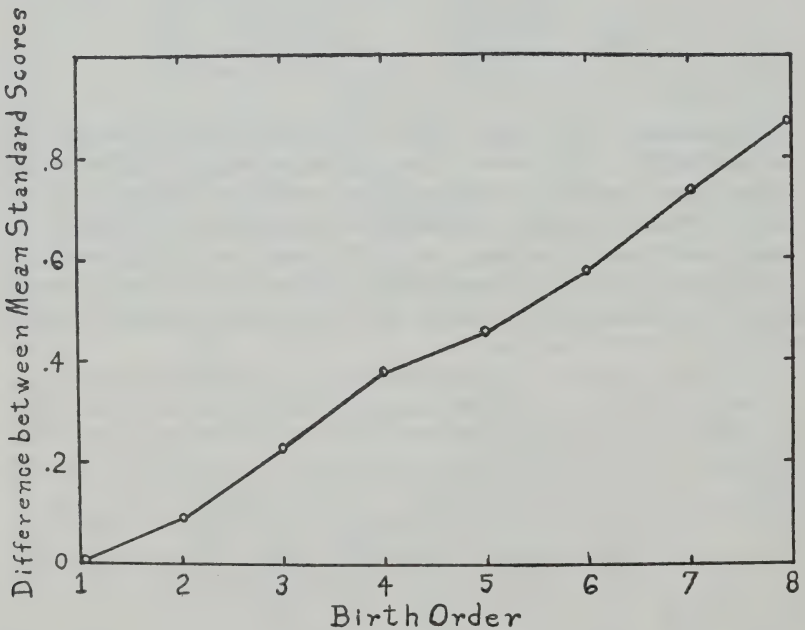


FIGURE 4

DIFFERENCE BETWEEN MEAN STANDARD SCORES BY METHOD OF
LEAST SQUARES

child's inheritance and development. It is not within the scope of this thesis to establish the exact amount of increase from one ordinal group to the next higher, yet it is interesting to note that there is indication that intelligence is directly proportional to birth order.

In order to check somewhat the foregoing solutions and to establish more definitely conclusions which might be drawn from this study, a more direct solution of the problem was made in the following manner. The problem was limited to include only those families for which there were data for the first two, the first three, or the first four children. The number of families that have more than two or three children attending public school at the same time is decidedly limited. Fortunately in the population here represented the data are adequate to include families of as many as four children. For families for which there were data for the first two children, the mean standard score of the first-born children is compared with the mean standard score of the second-born children. For families for which there were data for the first three children, the mean standard scores of the first-born, second-born, and third-born children are compared and, similarly, the mean standard scores of the first-born, second-born, third-born, and fourth-born children are compared in families for which there were data for the first four children. From the results of this solution, as indicated in Table 7 and shown graphically in Figure 5, it is apparent that intelligence increases with birth order, for, although the solution is limited to families of two, three, or four children, as the ordinal number increases the mean standard score also increases. The mean standard score of the 1,523 second-born children is greater than the mean standard score of their 1,523 first-born siblings; the mean standard score of the 542 third-born children is greater than the mean standard score of their 542 second-born siblings, and the mean standard score of these second-born siblings is greater than the mean standard score of their 542 first-born siblings. The same relationship holds between the mean standard scores of the ordinal groups when represented by the first four children of each family.

It is interesting to note that the mean standard score decreases as the number of children representing a family increases. When the comparison is limited to the first two children in a family as indicated by Curve A in Figure 5 the mean standard score for both first-born and second-born children is higher than the mean standard scores for those birth orders when the comparison includes the first three

children of a family as indicated by Curve B. The mean standard scores represented in Curve B, in turn, are greater than the mean standard scores represented by Curve C where the comparison is limited to families represented by the first four children. This indicates a tendency for the more prolific families to possess children of lower intelligence. The same factor seems to be present in the results plotted in Figure 1.

TABLE 7
MEAN STANDARD SCORES FOR EACH BIRTH ORDER

	Number of Families	Birth Order			
		1	2	3	4
A	1,523	5.187	5.288		
B	542	5.076	5.124	5.267	
C	164	5.023	5.126	5.227	5.401

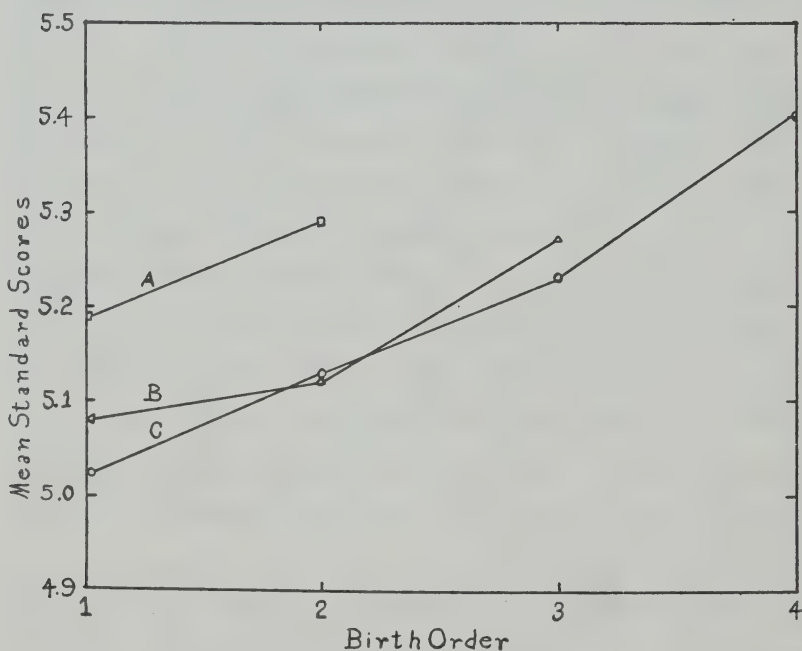


FIGURE 5

MEAN STANDARD SCORES FOR FAMILIES OF TWO, THREE, AND FOUR CHILDREN

Differences	
A	$M_2 - M_1 = .101$
B	$M_2 - M_1 = .048$
	$M_3 - M_1 = .191$
C	$M_2 - M_1 = .103$
	$M_3 - M_1 = .204$
	$M_4 - M_1 = .378$

A comparison of the results of the various methods of solution which have been made to disclose the relationship which might exist between intelligence and birth order shows a remarkable agreement as to the size of the increments in general as well as in the direction of differences in favor of the later-born children.

CONCLUSION

This study is limited to the disclosing of a general relationship between intelligence and birth order as revealed by a study of a large sampling of normal public-school children of the Caucasian race.

It is not the purpose of this study to establish the amount of increase or decrease which might be expected with each birth order, nor to establish the probability that a child representing any ordinal number will be superior or inferior intellectually to his siblings.

The conclusion drawn from this study applies only to children and their intelligence as related to ordinal number; whether the relationship found holds throughout adult life remains to be revealed by further study.

The writer recognizes that a large number of factors must be taken into account in explaining the differences in intellectual capacity of siblings. This study, however, makes no attempt at a solution or explanation of the cause or causes which might be operative in producing the results which are indicated in the conclusion. Undoubtedly there are both biological and environmental factors involved; what their nature might be or their relative influence is not within the scope of this study.

Although there are indications of many other interesting relationships, such as size of family and intelligence, economic status and intelligence, etc., these are incidental to the main problem: Intelligence and Birth Order in Family.

The conclusion of this study is that on the average later-born children have a higher intelligence quotient than earlier-born children: that in general, intelligence, as measured by intelligence tests, increases fairly uniformly with ordinal number up to and including eighth-born children.

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L'INTELLIGENCE ET L'ORDRE DE NAISSANCE DANS LA FAMILLE

(Résumé)

Le but de cette étude a été de découvrir une relation qui pourrait exister entre l'intelligence des enfants et leur ordre de naissance.

L'étude est basée sur les évaluations de l'intelligence de 10,000 élèves des écoles publiques et les données de questionnaires obtenus des parents sur l'ordre de naissance de leurs enfants.

Les quotients d'intelligence obtenus dans chacun de quatre différents tests collectifs d'intelligence ont été traduits en leurs résultats équivalents. On a employé seulement les résultats des enfants de la même famille dans cette étude. Pour contrôler la grandeur de la famille et les facteurs économiques et sociaux on a mis les résultats en paires de sorte qu'on compare aux résultats de chaque premier-né les résultats de son frère ou soeur deuxième-né, aux résultats de ce deuxième-né on compare les résultats de son frère ou soeur troisième-né, etc., jusqu'aux huitièmes-nés y compris.

On présente trois méthodes distinctes de solution du problème. La comparaison des résultats de ces solutions montrent un accord remarquable dans la grandeur des croissances aussi bien que dans la direction de la différence.

L'étude n'essaie pas d'expliquer les causes qui pourraient aider à produire les résultats. Sans doute elles comprennent les facteurs biologiques et ceux du milieu.

La conclusion de l'étude est qu'en moyenne les premiers-nés n'ont pas un quotient d'intelligence si élevé que celui des enfants de naissance postérieure; qu'en general, l'intelligence, comme mesurée par les tests d'intelligence, s'accroît dans l'ordre de naissance jusqu'aux huitièmes-nés y compris.

STECKEL

INTELLIGENZ UND GEBURTSORDNUNG IN DER FAMILIE

(Referat)

Das Ziel dieser Untersuchung war, Beziehungen zwischen der Intelligenz und der Geburtsordnung aufzudecken.

Die Untersuchung beruht auf Intelligenzprüfungen, die an 10,000 Volksschulkindern vorgenommen wurden, und auf den Antworten eines Fragebogens, die man von den Eltern der Kinder bezüglich der Geburtsordnung erhalten konnte.

Man übersetzte die Intelligenzquotienten, die man mittels vier verschiedener Gruppenintelligenzteste erhielt, in ihre entsprechenden Normalquotienten. Man berücksichtigte nur Angaben über Kinder mit Geschwistern. Um die Grösse der Familie und socialökonomische Faktoren zu berücksichtigen, wurden die Angaben so gepaart, dass das Erstgeborene mit dem Zweitgeborenen der Familie, und das Zweitgeborene mit dem Drittgeborenen, usw. bis und mit dem Achtgeborenen verglichen wurde.

In der vorliegenden Arbeit werden drei verschiedene Methoden für die Lösung des Problems dargestellt. Ein Vergleich dieser Ergebnisse zeigen eine auffällige Übereinstimmung hinsichtlich der Zuwachsbeträge als auch der Richtungsunterschiede.

Die Untersuchung macht keinen Versuch die Ursachen zu erklären, die die Ergebnisse hervorgerufen haben mögen. Unzweifelhaft sind Faktoren biologischer Natur und des Milieus beteiligt.

Die Untersuchung führt zur Schlussfolgerung, dass im Allgemeinen spätergeborene Kinder höhere Intelligenzquotienten haben als frühergeborene; dass die durch Intelligenzteste ermittelte Intelligenz mit der Ordnungszahl bis und mit dem achtgeborenen Kinde zunimmt.

STECKEL

THE TRAITS OF EXTROVERTS AND INTROVERTS*

From the Psychological Laboratories of Stanford University

R. A. C. OLIVER

REVIEW

Theory. The terms "extroversion"¹ and "introversion" were first used by Jung (11). The meaning he gave them may be illustrated from his *Analytical Psychology* (12). Arguing for an "energetic view-point," he holds that "all psychological phenomena can be considered as manifestations of energy.... This energy is subjectively and psychologically conceived as desire. I call it libido." After an examination of the types of mental disorder, he concludes that "hysteria is characterized by a centrifugal tendency of the libido, whilst in dementia praecox its tendency is centripetal." Carrying over this conclusion to more normal mental life, he proposes the terms "extroversion" and "introversion . . . to describe these two opposite directions of the libido." A subject is said to be extroverted "when he gives his fundamental interest to the outer or objective world, and attributes an all-important and essential value to it: he is introverted, on the contrary, when the objective world suffers a sort of depreciation, or want of consideration, for the sake of the exaltation of the individual himself, who then monopolizing all the interest, grows to believe no one but himself worthy of consideration."

Jung's theory has attracted considerable attention in recent psychology. His views have been discussed and expanded, and his "types" have been described, by Hinkle (8, 9), McDougall (13), Miller (15), Nicoll (16), Tansley (18), Van der Hoop (19), Wells (20), White (21), and others.

Conklin (1) deprecates the tendency to stress the abnormal degrees of extroversion and introversion. He emphasizes that the most normal condition is one of "ambiversion," and that there are normal degrees of extroversion and introversion. He defines extroversion

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¹Jung, Conklin and others actually use the form "extraversion." This is nearer the Latin, but we shall use the form "extroversion," as "extroversion" and "introversion" make a good pair.

and introversion in terms of the conditions of attention. In the extrovert the objective conditions of attention are dominant; in the introvert, the subjective conditions; and further, the subjective conditions in the extrovert are most closely related in content to the objective conditions, while in the introvert the subjective conditions are more abstract in content.

Hypotheses regarding the underlying physiological mechanisms of extroversion and introversion have been formulated by Gordon and McDougall. Gordon (4) assumes in the extrovert a relative facilitation of the exteroceptors and of the effectors, in the introvert a relative facilitation of the interoceptors and of the connector and autonomic systems; and he further supposes that in the extrovert, neural systems are relatively isolated, while in the introvert, they are more easily activated by other neural systems. McDougall (14) similarly argues, with some experimental evidence, that the brain of the extrovert is normally in a state of greater dissociation than that of the introvert, so that impulses pass more directly into overt action; and that this condition is due to "some chemical influence of the nature of a hormone or endocrine secretion, or some chemical resultant of the general metabolism." In reality, however, the physiological bases of extroversion and introversion are still matter for surmise and little more.

Experiment. Freyd (3) reviewed the literature on extroversion and introversion, and presented a list of traits considered by psychologists to be characteristic of introverts. Heibredner (6) used this list as a rating scale, and found that the traits, whatever they were to be called, did actually form a consistent set. Heibredner (7) also reported sex differences.

Laird, starting from Woodworth's Psychoneurotic Inventory, and providing for responses of the graphic rating-scale type, evolved his "Personal Inventory," designed to measure introversion-extroversion. Laird and his students at Colgate University have conducted with this test a series of investigations of many academic, vocational, and other groups.²

Conklin (2) regarded the tests of Heibredner and Laird as instruments for the selection of persons "with tendencies more or less well established towards an unhealthy introversion," and attempted to devise a measure of extrovert-introvert differences within normal-

²These investigations are listed in the manual of directions supplied with the test.

ity. Following his definitions (1), he constructed a test "based on the assumption that likes and dislikes are a fair indication of established attention conditions" (2).

THE PRESENT EXPERIMENT

Problem. Thus psychological insight into human behavior has formulated the concepts of extroversion and introversion and has indicated roughly what traits are to be included within the connotation of these terms. The aim of the present investigation is to determine, in the case of some of these traits, whether they really tend to occur together. Such a determination might be of assistance in the construction of a test for extroversion and introversion, which in turn might add further to the definition of these terms. The final scientific step would be the determination of the etiology of extroversion and introversion.

Selection of Subjects. The subjects of the experiment were mainly undergraduates of Stanford University, selected on the basis of their scores on Laird's Personal Inventory C2.

Laird's test is the most widely used test purporting to measure extroversion-introversion, and was employed as the readiest means of selecting individuals whom many would agree in calling extroverts and introverts.

The Personal Inventory C2 was given to 100 men and 25 women in the class of general psychology at Stanford University. For the men, the score was found above which were 90% of the scores, and also the score below which were 90% of the scores. These, the 10-percentile score and the 90-percentile score, were found to be 10 and 23, respectively. Similarly, for the women, the 10-percentile score and the 90-percentile score were found to be 11 and 24, respectively. All men with scores of 10 or less and 23 or more, and all women with scores of 11 or less and 24 or more, were asked to act as subjects in the experiment.

In addition 36 men and 18 women from other classes in the psychology department were tested with Personal Inventory C2, and again all men with scores of 10 or less and 23 or more, and all women with scores of 11 or less and 24 or more, were asked to act as subjects.

A member of the faculty, and his wife, also took the test, of their own accord. Both made scores within the appropriate limits, and acted as subjects of the experiment.

In all, 137 men and 44 women were tested.³ Of the 31 men who had the requisite scores, 29 were secured as subjects. Of the 11 women who had the requisite scores, 10 were secured as subjects. Thus there were 39 subjects altogether. Their distribution by sex and score is tabulated in Table 1.

TABLE 1
CLASSIFICATION OF SUBJECTS OF EXPERIMENT

	Extroverts	Introverts	T
Men	16	13	29
Women	5	5	10
Totals	21	18	39

The size of scores is supposed to be proportional to the number of introvert traits, a high score indicating a high degree of introversion, a low score indicating a low degree of introversion and therefore a high degree of extroversion. If the test is a valid one, the selection of subjects should have yielded rather extreme cases of extroversion and introversion. We shall call these subjects extroverts and introverts, meaning by these terms persons making the above defined scores on the Laird test.

Conditions of Testing. The following tests were employed:

Laird's Personal Inventory C2 (for self-ratings)

Laird's Personal Inventory C3 (for ratings by others)

Thorndike's Intelligence Examination for High School

Graduates

Conklin's Study of Likes and Dislikes

Strong's Vocational Interest Blank

The Kent-Rosanoff Free Association Test

The Pressey X-O Tests

Allport and Allport's A-S Reaction Study

Watson's Test of Public Opinion

The George Washington University Social Intelligence Test

The Stanford M-F Test

A mimeographed questionnaire (to be described later) and the grade-point ratio (a measure of scholarship) of each subject were also used.

When the individuals with appropriate scores on the Laird test C2

³The 10- and 90-percentile scores were calculated for the complete groups. Both for the men and for the women, they were found to be identical with the original percentile scores.

had been found, they were asked to cooperate in the experiment. With three exceptions they were able to do so, and became the subjects of the experiment.

The scores on the Thorndike Intelligence Examination were obtained from the Registrar of the University, all the students having taken the test as an entrance requirement. The grade-point scholarship ratios were also furnished by the Registrar.

The Personal Inventory C3 requires ratings of the subjects by their friends. The subjects were asked to supply the names and addresses of two friends who would be able and willing to make the ratings. The blanks were then mailed to the raters, with the necessary instructions, and an assurance that their ratings would be treated confidentially if they so wished. The raters filled out the blanks and returned them by mail.

The George Washington Social Intelligence Test, since it has time limits, was given as a group test. A group test procedure was also used with the Kent-Rosanoff Free Association Test to economize time.

The remainder of the tests (including the Laird test C2) have no time limits. They were given out one at a time in class, and the subjects were asked to return them completed at the next meeting of the class, usually two days later. They were urged to observe all directions carefully, and were given any additional instructions that were necessary. This procedure, allowing the subjects to do the tests more or less when and where they liked, was necessary in order that too great demands might not be made on their time and goodwill. There was every indication that for the most part they cooperated seriously and carefully. Reasonably complete sets of tests were obtained from all. Many of them expressed their interest in the tests and wished to be informed of all results. They were not told, of course, why they had been selected, but merely that they were a sampling of their class, though some may have made shrewd guesses at the real reason.

Results

Age. The subjects' ages were given by them in replying to the questionnaire. Those of the faculty member and his wife were omitted from the calculations because of their wide divergence from the others.

The mean age of the extroverts was 20 years 5.6 months, the mean age of the introverts was 21 years 6.5 months. This difference of

12.9 months has a probable error of ± 7.8 . There is therefore no significant age difference between the two groups.

Thorndike Intelligence Examinations. No correlation coefficients were worked out between Laird scores and scores on the Thorndike or any other test, because, since we have only the extreme of the Laird distribution, such coefficients would be difficult to interpret. Instead, the differences between the means of the two groups on the various tests have been used as indicators of relationship or its absence.

Thorndike scores were available for 20 extroverts and 17 introverts. The scores of two introverts who were foreign students who might have had language handicaps were not used, and this left 15 introvert scores. The mean score of the extroverts was 74.0, the mean score of the introverts was 80.5. This difference of 6.5 has a probable error of ± 2.9 , and is, therefore, 2.2 times its probable error.

This difference of mean Thorndike scores, only twice its probable error, just hints at a slight positive correlation between intelligence and introversion. Hoitsma (10) found no such correlation, but Conklin (2), using Laird's test, found a slight positive correlation of .21.

Scholarship. As a measure of university scholarship, the grade-point ratios of the subjects were used. The grade-point ratio is the ratio of the number of "honor points" gained to the number of units of work taken, the higher the ratio the better the scholarship.

Of 20 extroverts, the mean was 1.45. Of 17 introverts, the mean was 1.77. This is a difference of .32, the probable error of which is $\pm .11$. The difference is therefore reliable.

This result is in agreement with that reported by Hoitsma (10), who found a correlation of $.35 \pm .069$ between scholarship and introversion as measured by an early version of the Laird test. Hoitsma reported a virtual absence of correlation between the same measure of introversion and intelligence as measured by the Thorndike test. The present results would at least agree in showing that there is a closer relationship between introversion and scholarship than between introversion and intelligence. There must be factors other than superior intelligence conducing to the superior scholarship of the introverts.

Personal Inventory C3. This scale, on which the subject is rated by a friend, is practically identical with Personal Inventory C2, on which the subject rates himself.

For only 16 of the subjects were pairs of ratings returned, while for 17 subjects a single rating was returned, and after the ratings of the few women were excluded, only 13 pairs and 13 single ratings were left. All were therefore treated as single ratings, making 39 in all, of which 21 were on extrovert subjects and 18 on introverts.

How do the self-ratings compare with the friends' ratings? The self-ratings, it will be remembered, threw the extroverts and the introverts entirely apart, the extroverts being the lowest decile of the general distribution and the introverts the highest decile. Of the ratings by friends, the central tendencies of the two groups, at any rate, are well separated. The mean of 21 ratings on extroverts is 9.0; the mean of 18 ratings on introverts is 13.7. This difference of 4.7 has a probable error of only $\pm .79$.

The subjects being the same, however, and the scales apparently so similar, we should expect the extroverts and the introverts, so well discriminated by the self-ratings, to be rather well separated by the friends' ratings. In reality, considerable overlapping was found between the two groups: 9.5% of the ratings on extroverts reach or exceed (i.e., are more introvert than) the median introvert rating; 11.1% of the ratings on introverts fall below (i.e., are more extrovert than) the median extrovert rating.

We may conclude, then, that subjects who would be classed as extroverts or as introverts by their own ratings would by no means necessarily be so classed by the ratings of their friends.

The ratings by the subjects' friends were themselves, however, not in the closest agreement. In the case of the 16 subjects for whom pairs of ratings were available, the differences between the two friends in their ratings of the same subject ranged from 0 to 9 score points, with a mean of 3.75 and a standard deviation of 2.82. The range between the lowest and highest ratings was only from 2 to 21, so that two ratings of the same subject disagree on the average by nearly a fifth of the scale actually used. Such ratings by friends are, then, not very reliable, so that, even if the two kinds of ratings are really comparable, close agreement with self-ratings could not be expected.

Conklin's Study of Likes and Dislikes. 1) The score yielded by Conklin's test is an "extroversion-introversion ratio," the size of which increases with degree of introversion.

Conklin found for 483 students of both sexes an average score of 92.4. In the present study, the mean score of 20 extroverts of both sexes was 78.3. The mean score of 18 introverts of both sexes was

98.1. This difference of 19.8 has a probable error of ± 5.0 , and is therefore quite reliable.

Conklin found a sex-difference in extrovert-introvert ratios and gave as the average score of 151 male students 75.3. In the present study, the average scores of 15 extrovert men and 13 introvert men were 70.3 and 96.5, respectively. This difference of 26.2 has a probable error of ± 5.3 and is, therefore, also quite reliable. These data are summarized in Table 2.

TABLE 2
SCORES ON CONKLIN'S STUDY OF LIKES AND DISLIKES

	Conklin's Norms	Extro- verts	Intro- verts	Differ- ence	P.E. diff.	Difference
						P.E. diff.
Both sexes	92.4	78.3	98.1	19.8	5.0	4.0
Men only	75.3	70.3	96.5	26.2	5.3	5.0

Conklin calls individuals in the lowest quartile of his distribution normal extroverts, and individuals in the highest quartile normal introverts. Of our 15 extrovert men, 4 would be normal extroverts in Conklin's sense. Of our 13 introvert men, 5 would be normal introverts in Conklin's sense. None of the 5 extrovert women would be classified as normal extroverts by Conklin, and none of the 5 introvert women would be classified as normal introverts. One of our introvert men, indeed, and one of our introvert women would be normal extroverts according to Conklin, and one of our extrovert women would be a normal introvert.

The question naturally arises as to what is the relationship between the Laird test and the Conklin test. They are both called tests of extroversion-introversion. Yet in form and substance they are very different. Conklin himself writes: "Laird's procedure and mine are based on very different theoretical presuppositions and are designed for rather different purposes" (2). Conklin found a correlation between the two tests of only .37 (with 66 subjects) and .36 (with 77 subjects), which, he said, "indicates that the two measures are different in fact as well as in theory" (2). And we have just seen that there is no close agreement in the classification of individuals by the two tests. Nevertheless, Conklin's correlations, positive though small, and our thoroughly reliable difference between the means of the two groups, prove that the two tests have something in common.

An examination of the tests themselves shows that Laird's test is largely, though not exclusively, concerned with the subject's social relationships—his modes of feeling, thinking, and acting towards his fellows. Conklin's test aims at discovering the subject's preferences for activities such as sports or for intellectual and aesthetic pursuits. Now, differences in the interests pursued as leisure activities will obviously be not unconnected with differences in social adjustment. Laird's test, indeed, seems to make a wider sampling of traits, Conklin's test to make a more thorough assay of a narrower field. Laird, for example, makes one enquiry: "Have you given much attention to form and style in literature?" Conklin asks for several reactions to the idea of literature. Laird's question, indeed, "How have your likes for athletics and things intellectual compared?" is almost an epitome of Conklin's test. Laird's test does not ask enough about many things: Conklin's test does not ask about enough things. The Personal Inventory combined with Conklin's Study of Likes and Dislikes and perhaps some other tests like it would possibly yield a more valid measure of extroversion-introversion.

2) The items of the Study of Likes and Dislikes are to be rated by the subject on a pleasure-displeasure scale of nine points. For each of the 40 items of the test, the average rating was found for each of the two groups. The difference between the average extrovert rating and the average introvert ratings was found for each item. These differences ranged between .1 and 1.8, the average of the 40 differences being .6. The probable errors of these differences were not computed, except in the case of the largest difference,⁴ 1.8, which was found to have a probable error of $\pm .26$. Many of the differences were small and probably not statistically significant; however, the items which were found to be extrovert items (that is, in which the average extrovert rating indicated more pleasure than the average introvert rating) were in almost every case Conklin's "extrovert" items, and there was a similar agreement on the "introvert" items.⁵

Strong Vocational Interest Blank. The Strong Vocational Interest Blank was filled out by 19 extroverts and 17 introverts, 36 subjects in all.

1) Choices of vocation were indicated by 11 extroverts and 12

⁴Item 40, "To read essays on literary criticism."

⁵The exceptions were items 3, 5, and 29, with differences of 0.1, 0.2, and 0.5, respectively. Item 29 is, "To prepare a paper on some contemporary educational problem."

introverts. The larger proportion of introverts having definite notions about their future vocation is probably significant.

2) This is borne out by the fact that the introverts received, on the whole, much higher ratings on the vocations they chose than did the extroverts. See Table 3.

TABLE 3
VOCATIONAL INTEREST RATINGS OF 11 EXTROVERTS AND 12 INTROVERTS ON CHOSEN VOCATIONS

Rating	<i>A</i>	<i>B+</i>	<i>B</i>	<i>B—</i>	<i>C</i>
Extroverts	1	0	3	0	7
Introverts	3	3	2	1	3

A and *B* ratings indicate probably good choices of vocation, a *C* rating indicates a probably bad choice of vocation. Thus good choices were made by 4 extroverts and 9 introverts; bad choices were made by 7 extroverts and 3 introverts.

3) The vocations chosen for scoring, and the ratings made in them, are shown in full in Table 4.

TABLE 4
VOCATIONS CHOSEN, AND RATINGS RECEIVED BY (a) 11 EXTROVERTS AND (b) 12 INTROVERTS
(a) Extroverts

<i>A</i>	<i>B+</i>	<i>B</i>	<i>B—</i>	<i>C</i>
Mechanical engineer	Personnel Psychologist Lawyer	.....	Psychologist Lawyer (2) Advertising (2) Architect

(b) Introverts

<i>A</i>	<i>B+</i>	<i>B</i>	<i>B—</i>	<i>C</i>
Journalist Lawyer Author	Physician Author Lawyer	Author Physician	Advertising	Executive Insurance Author

4) The literature on the subject of extroversion and introversion contains many statements about the attitudes and behavior of the two "types." The Strong Vocational Interest Blank requires reactions to a great number of specific attitudes and behavior traits. It was thought that the Strong blank might itself be a good test of extroversion-introversion. No scoring keys have, of course, been worked out for extroverts and introverts; but, because of the frequency with

which literary interests are ascribed to introverts in the literature, and because of the data in Table 4, it was thought that scoring for "Author" might to some extent be equivalent to scoring for introversion. Accordingly, all the blanks were scored for interest as "Author." The ratings received by the two groups are shown in Table 5 (a).

TABLE 5 (a)
RATINGS RECEIVED ON STRONG VOCATIONAL INTEREST BLANKS SCORED FOR "AUTHOR"

Rating	A	B+	B	B—	C
Extroverts	0	1	0	0	18
Introverts	2	2	4	1	8

Thus our hypothesis was fairly well borne out. We are probably justified in concluding:

1) That the Strong Vocational Interest Blank contains a large number of items which discriminate between extroverts and introverts. Scoring keys could probably be worked out for extroversion and introversion.

2) That introverts have more interests in common with authors than extroverts have.

On the other hand, the literature frequently ascribes to introverts an interest in things mechanical, whereas the data in Table 4, and replies to the questionnaire, suggested that such an interest may be more characteristic of extroverts. Accordingly, all the blanks were scored for interest as "Engineer." The ratings received by the two groups are shown in Table 5 (b).

TABLE 5 (b)
RATINGS RECEIVED ON STRONG VOCATIONAL INTEREST BLANKS SCORED FOR "ENGINEER"

Rating	A	B+	B	B—	C
Extroverts	2	1	3	1	12
Introverts	0	0	2	0	15

We conclude from these data that the current emphasis on the possession of mechanical interests as an introvert trait is of doubtful warrant and needs investigation.

The Kent-Rosanoff Free Association Test. This test was given as a group test. The blanks published by C. H. Stoelting were used. These were distributed covered up by sheets of paper. The examiner called the number of the words (from 1 to 100), one every 10

seconds. As a number was called, the subjects exposed the corresponding word, and made their responses according to the standard directions. This procedure seems near enough to the usual one to make the results comparable.

The reactions were classified according to the scheme defined in Rosanoff's *Manual of Psychiatry* (17). Rosanoff's norms, the mean scores of 1,000 normal adults, are given for comparison.

TABLE 6

CLASSIFICATION OF THE REACTIONS OF 16 EXTROVERTS AND 17 INTROVERTS ON THE KENT-ROSANOFF FREE ASSOCIATION TEST

Types of reaction	1000 normal adults	Mean of extroverts	Mean of introverts	Difference of means	P.E. diff.	Difference P.E. diff.
Common reactions						
specific	85.5	85.9	81.2	4.7	± 2.0	2.3
non-specific	6.2	3.2	4.2	1.0	± 0.6	1.7
Doubtful reactions	1.5	0.8	1.3	0.5	± 0.3	1.7
Individual reactions	6.8	11.3	18.5	7.2	± 1.9	3.8
Failures of reactions	0.0	0.0	0.24	0.24		

The main results are that extroverts and introverts alike give individual reactions more frequently than Rosanoff's tables indicate as normal; and that introverts give individual reactions decidedly more frequently than extroverts. The latter result at least would be in accordance with the expectation.

The Pressey X-O Tests. The main scores yielded by the Pressey X-O Tests are the "total affectivity score" and the "total idiosyncrasy score," supposed to be measures of "affectivity" and of "emotional peculiarity," respectively. Other scores may be obtained by analysis, among them a score which is supposed to be a measure of "self-consciousness" or "shut-in personality"; this also was worked out, as a preliminary survey suggested that there might be a significant difference here between the two groups. The results are shown in Table 7.

Our results therefore suggest a difference in "affectivity"; and some such difference in the emotional life of extroverts and introverts would certainly be in accordance with expectation. If the definitely higher "idiosyncrasy scores" of the introverts indicate more unusual affective conditions, this also would be in accordance with

TABLE 7

MEAN SCORES OF 20 EXTROVERTS AND 16 INTROVERTS ON THE PRESSEY X-O TESTS

	Extroverts	Introverts	Difference	P.E. diff.	Difference
					P.E. diff.
Total affectivity	172.5	186.9	14.4	± 6.3	2.3
Total idiosyncrasy	48.3	53.4	5.1	± 1.7	3.0
Self-consciousness	6.1	9.8	3.7	± 0.84	4.4

expectation. And, finally, we should expect some such difference as the definitely higher "self-consciousness" scores of the introverts would seem to indicate.

The Allport A-S Reaction Study. 1) The score in this test is a measure of an individual's disposition to dominate, or to be dominated by, his fellows. Scores above the norm indicate ascendance, scores below the norm indicate submission. There are separate forms for men and women, and only the men's scores have been used.

The norm for men is $-.35$. The mean score of 15 extrovert men was $.33$. The mean score of 13 introvert men was -7.77 . This difference of 8.10 has a probable error of 4.91 . It is therefore not significant, but its direction is perhaps suggestive.

2) An attempt was made to find which items of the test were most discriminatory between the two groups, as follows:

TABLE 8

FREQUENCIES OF DIFFERENCES BETWEEN PERCENTAGE OF EXTROVERTS AND PERCENTAGE OF INTROVERTS MAKING A RESPONSE IN THE A-S REACTION STUDY

Magnitude of difference (% of E. minus % of I.)	Frequency
0—4.9	27
5—9.9	25
10—14.9	21
15—19.9	22
20—24.9	9
25—29.9	5
30—34.9	6
35—39.9	5
40—44.9	2
45—49.9	1
Total number	123

The Form for Men is different from the Form for Women. Only the tests of the men were used. There were 15 extroverts and 13 introverts. The number of extroverts and the number of introverts making each response was found. These numbers were converted into percentages of 15 and 13, respectively. Then the difference between the two percentages for each response was found. There are 123 possible responses in the test. Thus there were 123 differences. These differences were distributed as in Table 8.

There is a conveniently large drop in the frequencies after a difference of 20% has been reached. There are 28 responses out of 123 with a difference of 20% or more. These 28 most significant responses are listed below. The difference (percentage of extroverts minus percentage of introverts) is given in each case. A plus sign therefore indicates an extrovert response, a minus sign indicates an introvert response. The other (i.e., less discriminatory or non-discriminatory) responses are shown in parentheses for comparison.

2. (a) At a reception or tea do you seek to meet the important person present?

(usually —12)

occasionally +21

(never — 9)

- (b) Do you feel reluctant to meet him?

yes, usually —39

(sometimes +10)

no +29

3. At church, a lecture, or an entertainment, if you arrive after the program has commenced, and find that there are people standing, but also that there are front seats available which might be secured without "piggishness" or discourtesy, but with considerable conspicuousness, do you take the seats?

(habitually —16)

(occasionally —14)

never +30

6. (a) A professor or lecturer asks any one in the audience, say of 20 or more people, to volunteer an idea to start discussion. You have what appears to be a good idea, do you speak out?

- (b) Do you feel self-conscious when you speak under such circumstances?

very —47

moderately +21

not at all +27

7. You have heard that an acquaintance has been spreading rumors about you which, though not likely to be serious in consequence, are

nevertheless unjustified and distinctly uncomplimentary. The acquaintance is an equal of yours in every respect. Do you usually

- | | |
|----------------------------------|------|
| "have it out" with the person | 21 |
| (let it pass without any feeling | — 3) |
| (take revenge indirectly | — 1) |
| (feel disturbed but let it pass | —19) |
8. Someone tried to push ahead of you in line. You have been waiting for some time, and can't wait much longer. Suppose the intruder is the same sex as yourself, do you usually
- | | |
|------------------------------------|------|
| remonstrate with the intruder | 26 |
| ("look daggers" at the intruder or | |
| make clearly audible comments to | |
| your neighbor | —10) |
| (decide not to wait, and go away | 0) |
| (do nothing | —16) |
9. Do you feel self-conscious in the presence of superiors in the academic or business world?
- | | |
|------------|------|
| markedly | —39 |
| (somewhat | +14) |
| not at all | +24 |
13. When you are served a tough steak, a piece of unripe melon, or any other inferior dish at a high-class restaurant, do you complain about it to the waiter?
- | | |
|---------------|-----|
| (occasionally | —1) |
| seldom | +24 |
| never | —23 |
14. Have you crossed the street to avoid meeting some person
- | | |
|---------------|-----|
| frequently | —39 |
| (occasionally | —6) |
| never | +44 |
17. You desire to board a boat or train to see a friend off, or to enter an exhibition or park; the guard forbids you on what seems to be entirely unnecessary technicalities, do you argue with him and bluff your way past?
- | | |
|--------------|------|
| (habitually | —16) |
| occasionally | +41 |
| never | —24 |
19. Suppose you have recently become a salesman and are trying to sell life insurance to a middle-aged financier of great note. He says, "Young man, I don't know how long you have been in this game, but you will never succeed unless you acquire more experience and confidence in yourself." What will be your reaction?
- | | |
|------------------------------------|-----|
| (to persist in the attempt to sell | |
| insurance | —8) |

- | | |
|------------------------------------|-----|
| to agree and seek further advice | |
| from him | +24 |
| to become emotionally disturbed in | |
| your reply—angry, embarrassed, or | |
| condescending | —23 |
| (simply to take leave | 0) |
20. You are with a group of people in the woods, and although not certain of the path, you probably know as much about it as anyone present. Do you take responsibility of guiding the group?
- | | |
|--------------------------------------|-----|
| take the full responsibility | —34 |
| make suggestions or agree to share | |
| the responsibility | +34 |
| (let another take the lead according | |
| to his judgment | 0) |
22. (a) When you see someone in a public place or crowd whom you think you have met or known, do you inquire of him whether you have met before?
- | | |
|-----------|------|
| sometimes | +31 |
| (rarely | —15) |
| (never | —16) |
- (b) Are you embarrassed if you have greeted a stranger whom you have mistaken for an acquaintance?
- | | |
|-------------|------|
| very much | —26 |
| somewhat | +34 |
| (not at all | —10) |
29. Have you ever felt that a professor talks too much in class and should give you more chance to express your views and conclude points?
- | | |
|--------------|------|
| (frequently | — 8) |
| occasionally | +34 |
| (never | —19) |
30. (a) Have you largely on your own initiative in the past five years organized clubs, teams, or other such groups?
- | | |
|------------------|------|
| (more than three | — 1) |
| one to three | +37 |
| none | —37 |
- (b) Have you within the past five years been recognized as leader, (president, captain, chairman) of groups?
- | | |
|----------------|------|
| (more than six | — 3) |
| one to six | +26 |
| (none | —16) |

The Watson Test of Public Opinion. This test is intended to measure deviations from fair-mindedness. The gross score of an individual indicates his general level of prejudice. It can be analyzed

into twelve other scores indicating the extent to which his prejudices are in agreement with the following twelve points of view:

- I. Economic radicals.
- II. Economic liberals.
- III. Economic capitalists.
- IV. Persons interested in a "social gospel" rather than an individualistic interpretation.
- V. Persons interested mainly in a "personal gospel," prayer, mysticism, communion, salvation, etc.
- VI. Fundamentalists, "orthodox."
- VII. Modernists, holding liberal Christian views.
- VIII. Religious radicals, very broad, displeased with most existing Christian manifestations of religion.
- IX. Protestants who are inclined not to think much of Catholics.
- X. Catholics who are inclined not to think much of Protestants.
- XI. Persons with high, strict standards of sex-ethics, amusement, "bad habits," or similar moral matters.
- XII. Persons with broad, tolerant standards of sex-ethics, amusement, "bad habits" or similar moral matters.

The mean scores of 20 extroverts and 16 introverts are tabulated in Table 9.

There is no difference between the two groups in general level of prejudice. Nor is there any difference along any aspect of religious opinion, as far as these results indicate. There is a definite tendency

TABLE 9
MEAN SCORES OF 20 EXTROVERTS AND 16 INTROVERTS ON THE WATSON TEST OF PUBLIC OPINION

Prejudice in agreement with	M_E	M_I	Difference	$P.E.$ <i>diff.</i>	Difference $\frac{P.E.}{diff.}$
Gross score	19.5	20.3	-0.8	1.6	0.5
I. Economic radicals	7.0	9.3	-2.3	1.3	1.8
II. Economic liberals	10.0	17.4	-7.4	1.9	3.9
III. Economic capitalists	12.9	12.9	0.0	1.5	..
IV. Social gospel	13.0	14.8	-1.8	1.3	1.4
V. Personal gospel	7.8	7.3	+0.5	1.1	0.5
VI. Orthodox fundamentalists	7.1	6.0	+1.1	0.7	1.6
VII. Modern liberal Christians	15.0	15.8	-0.8	1.5	0.5
VIII. Religious radicals	13.6	15.4	-1.8	2.1	0.9
IX. Protestants	5.4	5.6	-0.2	1.0	0.2
X. Roman Catholics	9.8	9.9	-0.1	1.1	0.1
XI. Strict moral standards ..	4.4	6.8	-2.4	1.1	2.2
XII. Liberal moral standards	19.4	19.6	-0.2	2.5	0.1

for introverts to hold more pronounced liberal views on economic issues. And there is a suggestion that introverts favor stricter moral standards.

The George Washington Social Intelligence Test. The purpose of this test is sufficiently indicated by its name. The mean score of 15 extroverts was 108.5. The mean score of 18 introverts was 112.2. This difference of 3.7 has a probable error of 3.7. Thus there is no difference between the two groups in whatever is measured by the test.

The Stanford M-F Test. The M-F Test is being developed at Stanford University as a test of "masculinity-femininity." Scores are proportional to the degree of "masculinity."

The women's scores were too few to treat. Of 12 extrovert men, the mean score on the M-F Test was +108.3. Of 11 introvert men the mean score was +66.8. This difference of 41.5 has a probable error of 7.5. Thus the extrovert men are decidedly more "masculine" than the introvert men. This bears out the statement frequently met with in the literature that introverts are "effeminate" as compared with extroverts.

Questionnaire. This consisted of a number of questions suggested by a perusal of the literature.

Owing to consideration of space, only the more outstanding results are given, and these only in descriptive form.

1) The introverts, on their own showing, had more relatives outstanding both for desirable and for undesirable qualities than the extroverts.

2) The introverts were able to give reasons for adopting their present line of work in a considerably greater proportion of cases than the extroverts. An analogous tendency has been noted in connection with the Strong Vocational Interest Blanks.

3) The extroverts have held more positions of responsibility or leadership at the university than the introverts.

4) The extroverts have participated in all sorts of social organizations to a greater extent than the introverts.

5) Asked to rate themselves for various kinds of ability, the extroverts rated themselves high for mechanical ability and low for literary ability, while the introverts rated themselves high for literary ability and low for mechanical ability. This may be compared with the results of the Strong Vocational Interest Blanks.

6) Asked to rate themselves for various kinds of interests, the

introverts rated themselves considerably higher than the extroverts for interest in literature. Again compare with the Strong results.

7) Five introverts admitted having had an "unpleasant feeling of inferiority," while no extroverts did so.

CONCLUSION

The results have been given in full in the preceding section, and need not be repeated here. An attempt may be made, however, to view them in their proper perspective.

By means of one of the most generally used tests of extroversion and introversion, a group of extroverts and a group of introverts were selected. By applying further tests to these groups, it was found that certain new statements might be predicated of them; for example, that extroverts are more "masculine" than introverts, or that introverts have more liberal opinions on economic issues than have extroverts. The description of extroverts and introverts has thereby been made more definite.

A more definite description of the two groups should facilitate the construction of a more adequate test of extroversion and introversion. Some suggestions for such a test have been discovered. It might contain word-association items. It might contain items of the kind found in the Strong blank and the M-F Test. Items of the Conklin type should be included. Certain items of the A-S Reaction Study, it has been shown, would prove discriminatory. Items designed to bring out differences of attitude with respect to economic questions would prove valuable. A composite test on these lines would have a broader basis than the Laird test, and could hardly fail to be more valid.

With a good measuring instrument available, the problem of the etiology of extroversion and introversion could be more hopefully attacked.

The case studies suggest that no one cause will readily account for all the manifestations of extroversion and introversion. The concepts extrovert and introvert do seem to correspond to coherent sets of characteristics; but it must never be forgotten that within each group of individuals there are great individual differences.

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California

LES TRAITS DES EXTROVERTIS ET DES INTROVERTIS

(Résumé)

On a fait subir le test Laird d'introversion et d'extroversion "Personal Inventory C2" à des sujets universitaires des deux sexes, et on a fait subir à 39 sujets (29 hommes et 10 femmes) dont les résultats se trouvaient dans le décile le plus élevé ou le moins élevé de leur sexe les autres tests suivants: Personal Inventory Laird C3, le Test d'Intelligence Thorndike pour les diplômés des écoles supérieures, le Test Conklin des choses préférées et non préférées, le Test Strong de l'Intérêt Professionnel, le Test Kent-Rosanoff, le Test Allport A-S de Réaction, le Test Watson de l'opinion publique, le Test George Washington de l'Intelligence Sociale, le Test Miles-Terman de la Masculinité et Féminité des Intérêts. Voici quelques-uns des résultats les plus importants: (1) les introvertis sont un peu supérieurs aux extrovertis dans les résultats d'intelligence et l'évaluation de rendement scolaire; (2) les résultats des mêmes sujets dans les tests C2 et C3 Laird ne s'accordent pas très bien; (3) le Test Conklin a peu de commun avec celui de Laird; (4) les introvertis et les extrovertis montrent des différences d'intérêts professionnels, le génie, par exemple, étant un choix typique de l'extroverti; (5) dans le Test Kent-Rosanoff, les introvertis donnent plus de réactions individuelles que les extrovertis; (6) les deux groupes montrent des différences d'affectivité dans le Test X-O Pressey; (7) les introvertis ont des opinions plus libérales sur les questions économiques et aiment une moralité plus sévère; (8) les deux groupes ne montrent pas de différences frappantes dans les résultats d'intelligence sociale; (9) l'extroversion a une corrélation positive avec la masculinité mentale; (10) le groupe des introvertis avait montré beaucoup moins souvent des qualités directrices dans les activités universitaires que le groupe des extrovertis, et avait moins souffert des sentiments d'infériorité.

OLIVER

DIE MERKMALE DER EXTROVERTEN UND INTROVERTEN

(Referat)

Laird's Introversion-Extroversion Test "Personal Inventory C2" (Inventur der Person C2) wurde Versuchspersonen beiden Geschlechts der Universität gegeben. Ausserdem erhielten 39 Versuchspersonen (29 Männer und 10 Frauen), deren Testzensur im höchsten oder—niedrigsten Zehntel war, die nachfolgenden Tests: Lairds Personal Inventory C3 (Inventur der Person C3), Thorndikes Intelligenzprüfung für High School Graduates (für solche, die die Schlussprüfung der höhern Knaben- und Mädchenschulen, 14, bis 18. Altersjahr, bestanden haben), Conklins Test der Neigungen und Abneigungen, Strongs Test der Berufsinteressen, der Kent-Rosanoff Test, Allports A-S Reaktionstest, Watsons test für öffentliche Meinung, der George Washington Sozialintelligenztest, der Terman-Miles Test maskuliner und weiblicher Interessen (Masculinity and Feminity of Interests). Die wichtigsten Ergebnisse sind die nachfolgenden: 1) die Introverten weisen ein wenig höhere Intelligenzquotienten und bessere Zensuren in Schularbeiten auf als Extroverte; 2) die Ergebnisse derselben Versuchspersonen nach Lairds C2 und C3 Test stimmen nicht genau überein; 3) Conclins Test hat wenig gemein mit Lairds; 4) Introverte und Extroverte unterscheiden sich bezüglich ihrer Berufsinteressen, der

Ingenieurberuf beispielsweise wird typisch von Extroverten gewählt; 5) im Kent-Rosanoff Test reagieren Introverte individueller als Extroverte; 6) die beiden Gruppen unterscheiden sich hinsichtlich ihrer Gemütsempfindsamkeit im Pressey X-O Test; 7) Introverte haben entschieden freiere Auffassungen über ökonomische Streitfragen und bekennen sich zu strikteren moralischen Überzeugungen; 8) die beiden Gruppen unterscheiden sich nicht wesentlich hinsichtlich ihrer Sozialintelligenz; 9) Extroversion ist positiv korreliert mit männlicher Geistesart; 10) die Introvertierten haben sich in studentischen Angelegenheiten (university activities) viel weniger häufig als Führer entfaltet als Extroverte und haben unter Inferioritätsgefühlen weniger gelitten.

OLIVER

COLLECTIVE BEHAVIOR OF CHILDREN AT A PRESCHOOL AGE

From the Institute of Educational Research, Ukraine (Kharkov)

A. S. SALUSKY

One of the most important problems of the modern social pedagogy is the problem of children's associations or collectives. Though the question has been treated by such eminent writers as Groos, Stanley Hall, Claparède, Stern, Warendonc, and others, the problem is not yet sufficiently worked out.

Modern pedagogy attaches the greatest importance to the formation of social habits in children at an early age. It is a problem of special interest to the educators of the Soviet Republics. Failing to find in modern literature any information on a series of questions concerning the development of association habits in children, the educators of the U. S. S. R. have been obliged to make investigations into the character of children's associations.

They have had to begin by working out the methods of research. The majority of writers who have studied children's games have adopted the system of observation. Others, as, for instance, Warendonc, have gathered data by means of biographical sources, etc. Not one of these methods has been well worked out, and none can be applied in the hope of attaining good results. We have therefore been obliged to formulate a plan of research which enables us to make investigations without great inconvenience. The basis of children's association investigations is the system of observation, checked by natural experiment.

What is meant by the term "collectives"? There have always been in sociology two points of view as to the actual nature of human society. One of the points is the *mechanical nominalism*, with Tarde as its representative. The other side is that of the so-called organic school of sociology, with Spencer, Lilienfeld, Worms, etc., as its representatives. Neither of these standpoints can be considered as the point of departure for the study of children's collectives, because neither solves the problem of social interaction. The interaction of unorganic units (electrons and protons) cannot be

identified with the interaction of men in human associations (as some representatives of the mechanical point of view do). Nor can the interaction of social order be identified with the interaction of physiological aggregates, as the organic school does. We have in reality different types of interaction:

- 1) The interaction of inorganic elementary particles
- 2) The interaction of organic elements
- 3) The interaction of organic system
- 4) The interaction of social order

Each type of interaction has its own specific qualitative characteristic. Therefore, it is not right to identify social interaction with the interaction of particles of inorganic matter and explain the social phenomena by various combinations of electrons and protons (Albert P. Weiss). Such explanation is but general, it does not explain the social phenomenon.

In human associations we observe the interaction of the highest type. The best way of observing their genesis is in observation of children's collectives. The study of these collectives gives ample food to educators and sociologists. Although the children's groups are built on a specific type of reciprocal influence, this characteristic is not sufficiently differentiating to make it possible to consider every group with this group of symptoms as collectives.

We introduce, therefore, a second item, that of conjoint reaction. The definition of the collective, then, may be formulated as follows: The collective is a group of persons between whom is observed an interaction, a group which reacts as a whole to a given situation.

This is a general definition that can be applied to various types of associations. The types of the collectives vary greatly. One has to classify them in order better to work out the technique of their study. The following classification seems the best.

- 1) Spontaneous
 - a) short-lived collectives
 - b) durative collectives
- 2) Organized
 - a) short-lived collectives
 - b) durative simple collectives
 - c) durative complex collectives

The first type of collectives are associations for play when the game is originated by the children, and represents a train, a tram-

way, etc. This kind of association lasts but a few minutes, breaks up, and often is not renewed with the same children. Daily gatherings of children leading to friendship, and gangs or bands of homeless children illustrate the second type of collective.

The meeting is an example of a simple short-lived collective; a school group is representative of an ordinary durative collective, and schools or children's homes are examples of complex durative associations. One has to adopt the same plan for studying all types of associations as a basis of adopting a general hypothesis which explains the behavior of children's collectives.

The basic hypothesis used as a point of departure is that the behavior of the collectives, i.e., its reactions, are determined by exogenous and endogenous stimuli. The exogenous stimuli are those that influence the children who have joined the collective in its own environment, as well as those that are the result of the surrounding situation.

Our classification of stimuli is as follows:

- 1) Exogenous stimuli
 - a) the environment
 - b) the situation
- 2) Endogenous stimuli
 - a) the children
 - b) their number
 - c) their tendencies for organization and disorganization
- 3) Reactions of collectives

Taking the above scheme as a point of departure, it is easy to compose a detailed plan for studying a given association type. The scheme will give the examiners the same chance of studying any type of association. We have a scheme for each type of collective, but we will not give them here, for our aim is to demonstrate the problem of children's spontaneous collectives on the basis of data studied in *Ukrainia*. Records have been made while observing the children's behavior in collectives amid their natural environment, such as in the kindergarten, children's home surroundings have been collected supplementarily. It explains many a problem relating to the organization or breaking up of associations. Our intention is, however, to speak about the general qualities of these associations. We have, therefore, to give some statistical data and make some deductions. Let us examine three researches made in various parts

TABLE 1
PERCENTAGE OF COLLECTIVES OF VARIOUS DURATIONS

Time in minutes	Peasant children	Town children	
	in the Berdiansk District	Kharkov	Odessa
2-10	45	38.5	38.3
11-20	20	27.0	10.3
21-30	13	19.5	18.2
31-40	22*	7.0	8.8
41-50		5.0	8.8
51-60		1.5	4.8
61-70		1.5	1.8
100+			

*This number indicates the number of collectives that lasted over 30 minutes.

of Ukraina, i.e., at Odessa, Kharkov, and in several villages in the Berdiansk District. The number of collectives timed in Odessa was 889, in Kharkov, 200, and in the Berdiansk District, 170. The children's ages vary from 4 to 8 years in Odessa, $1\frac{1}{2}$ to 4 in Kharkov, and 2 to 6 in the Berdiansk District. Table 1 presents the data on the duration of the associations.

The duration of collectives depend largely upon the character of the game. The latter is determined by the child's stock of experience and by the degree of formation of his anatomic and physiological development, both of which depend upon his age. The following table shows the relation between the duration of association and the age of the children. The first group of the kindergarten is composed of children from $3\frac{1}{2}$ to 5 years of age. The second group of children is from 5 to 8 years. These groups spend their longest free interval together. A greater number of the elder children take part in the associations. Records were made during the interval. The number

TABLE 2
RELATION BETWEEN AGE AND DURATION OF TWO KINDERGARTEN GROUPS

Time in minutes	Kindergarten A	Kindergarten B	
	Group 1 ($3\frac{1}{2}$ -5)	Group 2 (5-8)	Groups 1 and 2 (4, 5-7—)
1-10	65.2%	25.4%	52.1%
11-20	21.2	10.2	30.5
21-30	6.5		8.7
31-40		8.4	8.7
41-50		40.5	
51-60		10.5	
61-100	2.2	15.0	

TABLE 3
RELATION BETWEEN AGE AND DURATION OF GROUP

Time in minutes	1 year 6 months to 2 years 7 months	2 years 3 months to 4 years
2-10	96.4%	36.0%
11-20	3.6	31.0
21-30		19.8
31-40		
41-50		3.8
51-60		1.4
61-100		2.0

of recorded associations is 69. The groups are nearly equally divided as to numbers (34-35).

Table 2 shows comparisons between two other groups, one of which is composed of children from 1 year 6 months to 2 years 7 months, and the other of children from 2 years 3 months to 4 years.

Many tables of comparison can be given of associations composed of children of various ages. Our intention is only to point out the basic tendency, i.e., *associations of older children are of longer life than associations of younger children*. It is only a tendency, not a general law. The older children's associations are not always durative; their duration depends upon a series of factors.

The number of children associated in a collective depends to a certain degree upon their age. Table 4 illustrates the relationship between two age groups and the number observed in groups at play.

All examiners record the larger and more durative type of older children's associations. One has to observe, however, that the number of children is sometimes forcibly held high in one group and limited in the other. In the course of our investigations it has been difficult to find collectives with an equal number of children. The same can be said about the sex composition of groups. According to my

TABLE 4
RELATION BETWEEN AGE AND SIZE OF GROUP

No. of children	1 year 5 months to 2 years 3 months	2 years 3 months to 4 years
2-3	67%	29%
4-5	18	40
6-7	9	19
8-10	6	7
11-20		5

data, 32% of one-sex associations have been registered in Kharkov; according to Shevaleva's, 67% in Odessa; and 47% according to *Berdiansk Pedagogical Technicum*, where peasant children are observed, as has been mentioned above. The ages of these groups was 4 years for Kharkov, 6 years for Berdiansk, and 8 years for Odessa. Probably the high percentage of one-sex associations is due to the children's age, but this has not yet been checked.

It is highly important when studying the behavior of children's groups to observe the factors which form the collective. One of the principal factors is the influence of the environment, in the wide sense of the word; another is the influence of a given situation over the organization and behavior of the collective. We set aside the purely biological factors. The influence of the milieu is observed in the character of games which unite the children. Children of the children's homes, who are rarely in the street, reproduce in their games the life of the establishment, i.e., dinner, medical examinations, food-preparation in the kitchen, etc. The peasant children represent their family life in their games and often the life of the domestic animals, horses, cows, poultry, all of which is unknown to town children.

The character of games reflects the surroundings so vividly that by a score or two of association records it is easy to define not only the social position of children but also the situation of their village. Games are observed in villages situated on the seashore or banks of navigable rivers which are not seen in villages situated in the plains.

Professor Doroshenko's (Kiev) record, based on our scheme, gives a clear illustration of the dependence of games and the character of the collective upon the surroundings.

Two kindergartens have been examined, which have approximately equal numbers of children and an equal distribution of boys and girls (the number of children being 35 in one association and 32 in the other; the corresponding number of boys, 14 and 13).

TABLE 5
AGES OF CHILDREN IN TWO KINDERGARTEN GROUPS

Age	Kindergarten No. 1	Kindergarten No. 2
3-4	2	2
4-5	12	9
5-6	10	13
6-7	11	11

TABLE 6

PERCENTAGE OF CHILDREN TAKING PART IN GAMES REPRESENTING VARIOUS LIFE SITUATIONS

Life situation represented	Kindergarten No. 1	Kindergarten No. 2
Old mode of life	6.25	49
Labor	14.62	36
Small tradesmen	.03	9
Communal household	24.16	
Ways of communication	10.42	
Revolutionary mode of life	6.24	
Fairy tale dramatization	8.30	6
Revolution in the games	16.60	
Other	10.91	
	97.53%	100%

Table 5 shows the children's ages.

Eighty-one percent in Kindergarten No. 1 are children of qualified workers and employees, all being socially active, i.e., taking part in public life and public organization. These children come from families who live in the modern mode, their parents do not go to church, do not say their prayers; they often have their dinners in public restaurants, etc. Nearly all are readers, they have their books and newspapers. Kindergarten No. 2 is situated on the outskirts of the town; a large percentage (70%) are children of unskilled workers, small tradesmen, and, in general, the proletariat. The old mode of life is prevalent in these families. Neither parents nor children take any part in public life. About 70% are members of the Trade Union, but they take no active part in professional life.¹

Forty-nine associations are recorded in Kindergarten No. 1, 65 in Kindergarten No. 2.

The percentages of children in the two kindergarten groups who took part in the games representing various life situations are shown in Table 6.

Table 7 shows the percentage of groups in which various numbers of children participated.

¹The limits of this article do not permit us to give the detailed characteristics of the kindergarten environment, but we hope that the aforesaid makes the difference between the two kindergartens sufficiently clear.

TABLE 7
PERCENTAGE OF GROUPS IN WHICH FROM 4 TO 35 CHILDREN
WERE REPRESENTED

No. of children in group	Kindergarten No. 1	Kindergarten No. 2
4	8.3 to 4	38.85
5-10	18.75 to 5	20.90
10-15	27.05 to 6	16.25
15-20	12.05 to 7	15.00
25-30	14.16 to 8	11.00
30-35	14.62	
	94.93%	102%

No marked age or sex differences were observed. Thus in Kindergarten No. 1 there are 8.33% of one-sex associations and in the Kindergarten No. 2 there are 12%; there are 11% of children of the same age in Kindergarten No. 1, and 12% in No. 2.

The above data show that the character of games is determined by the home environment of the children, which in its turn determines the duration of the association and the number of partakers. Since each game develops certain habits, the children's games are of great interest for the educator. Family games with children representing their father as a drunkard beating and scolding his wife cannot be held from a pedagogical point of view on the same level as games representing a tramway or a cooperative store. A problem arises, how is the educator to influence the character of free-chosen games? Is it possible to change the character of games without interfering during the process of the game? Our investigations show that the situation generally acts as a stimulus calling forth certain traits of the child acquired in his home environment. The experience of a 4-to-6-year-old child is rather great. The response evoked at any time depends largely upon the situation and the leaders, who are present in many of the associations. According to one observation, 75% of associations have leaders; according to Professor Doroshenko, 77% in Kindergarten No. 1, and 66.7% in No. 2; according to Professor Shevaleva, 52%.

The problem of leadership is of the highest importance, but it has to be studied against a background of processes which go on in associations.

The leader is an endogenous stimulus, but we are not going to discuss this question, leaving it for another time. We are only point-

ing out the rôle of exogenous stimuli produced by a given situation. As is shown by data, the situation plays the rôle of the exciting but not decisive moment. Only in boarding schools where children are rarely in the street, and the everyday situation is at the same time the children's milieu—the "subject" of the games played are taken from the life of the establishment.

The older the children, the larger is their experience and the more varied their cooperative enterprises.

To verify this deduction, we carried out some experiments in taking some of the groups of children on excursions, and leaving the others. These trips resulted in new games for the first (cooperative stores, factories, etc.). In this way undesirable games can be supplanted by others without special training, only by enlarging the children's experience in a certain direction. Through the games the child acquires social habits of a positive order.

SUMMARY

1) Modern education is greatly interested in the development of social habits. The problem of children's collectives is, therefore, the basic problem and the least worked out of problems.

2) Before investigating human associations in general, and children's collectives in particular, it is necessary to define the collective. In sociology there are two points of view which are in constant opposition, the "mechanical" view, considering the association as a "sum" (number) of individuals, and the "organic" view, considering them in the light of organisms. Neither solves the problem of social interaction.

3) Interactions of a social order have their own specific qualities, distinguishing them both from the interaction of unorganic particles and from the interaction of organic systems and organic elements. They require special study. Much can be gained from general as well as from educational sociology by studying the genesis of social interaction between children and children's collectives.

4) Under the term of collective, we understand a group of persons between whom there is a certain interaction and who react as a whole to the stimuli of a situation. Many types of collectives can be considered under this definition; it is therefore necessary to adopt a definite classification. According to the classification of the majority of U. S. S. R. association-examiners, children's collectives are

easily subdivided into five types: two kinds of spontaneous collectives and three types of organized collectives.

5) The basic hypothesis which is our point of departure in the study of children's collectives is the supposition that children's behavior (towards the collective as a system) is determined by exogenous and endogenous stimuli. Here we touch upon the subject of one type of collective only, namely, short-lived spontaneous collectives.

6) The study of children's collectives in various parts of Ukraina, according to our plan, gives constant figures relative to the duration of the association and the number of participants.

7) The duration and size (volume) of associations is determined by the stock of social experience of children joining the collective, as well as by the degree of development of their anatomical and physical "mechanisms" of behavior.

8) The behavior of the collective is determined by the children's environment and by the source of their experience. The stimuli of a situation acts as the excitors.

9) Not touching the social problem as to the character of the association's inner relations, we point out only the important influence of leaders, who have been recorded in 50-75% of the examined collectives.

10) The little we know of children's collectives in conjunction with the above investigations enables us, however, to eliminate undesirable associations and call out desirable ones. This gain shows the practical importance of studying children's associations.

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LE COMPORTEMENT COLLECTIF DES ENFANTS À L'ÂGE PRÉSCOLAIRE

(Résumé)

L'éducation moderne s'intéresse beaucoup au développement des habitudes sociales. Le problème des collectifs des enfants est donc le problème fondamental et le moins résolu. Avant d'étudier les associations humaines en général et les collectifs des enfants en particulier, il faut définir le collectif. En sociologie il se trouve deux points de vue qui s'opposent constamment, la vue "mécanique", où l'on considère l'association comme la "somme" (nombre) des individus, et la vue "organique", où l'on considère les groupes comme organismes. Ni l'une ni l'autre de ces points de vue ne peut résoudre avec succès le problème de l'interaction sociale. Les

interactions d'ordre social ont leurs qualités spécifiques, qui les distinguent de l'interaction des éléments inorganiques et de l'interaction des systèmes organiques et des éléments organiques. Elles exigent des études spéciales. On peut apprendre beaucoup en étudiant la genèse de l'interaction sociale dans les collectifs des enfants.

Par le terme, collectif, on comprend un groupe de personnes entre lesquelles il y a une certaine interaction et lesquelles réagissent comme groupe aux stimuli d'une situation donnée. Il existe bien des types de collectifs; il faut donc adopter une classification définie. Selon la classification de la plupart des investigateurs de la U. S. S. R., on peut subdiviser facilement les collectifs des enfants en cinq types, deux types de collectifs spontanés et trois types de collectifs organisés.

L'hypothèse fondamentale d'où l'on part dans l'étude des collectifs des enfants est la supposition que leur comportement est déterminé par des stimuli exogènes et endogènes. Ici il s'agit du sujet d'un type seulement de collectif, le collectif spontané de courte durée.

L'étude des collectifs dans divers parties de l'Ukraine donne des chiffres constants relatifs à la durée de l'association et au nombre des participants. La durée et la grandeur des groupes sont déterminées par la quantité d'expérience sociale des enfants qui font partie du groupe, aussi bien que par le degré de développement de leurs mécanismes anatomiques et physiques de comportement. Le comportement du collectif est déterminé par le milieu des enfants et par la source de leur expérience.

On a noté l'influence des enfants possédant des qualités directrices dans 50% à 75% des collectifs étudiés.

Le peu que l'on sait des collectifs des enfants conjointement avec les investigations rapportées dans cette étude nous permet cependant d'éliminer les associations peu désirables et de causer celles qui sont désirables en élargissant les expériences des enfants. Ceci montre l'importance pratique de l'étude des collectifs des enfants.

SALUSKY

DAS KOLLEKTIVVERHALTEN VON VORSCHULPFLICHTIGEN KINDERN

(Referat)

Moderne Erziehung schenkt der Entwicklung sozialer Gewohnheiten grosse Aufmerksamkeit. Das Problem der Kindergemeinschaften ist darum das Grundproblem, ist aber zugleich das wenigst ausgearbeitete. Bevor wir Menschenvereinigungen im Allgemeinen und Kindergemeinschaften im Besondern untersuchen, ist es notwendig Gemeinschaft zu definieren. In der Sociologie stehen sich immer zwei verschiedene Auffassungsweisen gegenüber, die mechanistische, unter der die Gemeinschaft als Summe (Anzahl) der Individuen, und die organische, unter der die Gruppen als Organismen betrachtet werden. Keine der beiden Betrachtungsweisen kann dem Problem der gesellschaftlichen Wechselwirkungen gerecht werden. Wechselwirkungen gesellschaftlicher Natur haben Eigenarten, die sie von Wechselwirkungen unorganischer Körper und von denen organischer Systeme und organischer Elemente unterscheidet. Sie beanspruchen ein besonderes Studium. Man kann darüber guten Aufschluss bekommen durch das Studium der Entstehungschichte sozialer Wechselwirkungen in Kindergemeinschaften.

Unter dem Ausdruck Gemeinschaft verstehen wir eine Gruppe von Personen zwischen welchen eine gewisse Wechselwirkung besteht und die als Ganzes auf die Reize einer gegebenen Situation reagieren. Es bestehen viele Typen von Gemeinschaften; es ist darum notwendig eine bestimmte Einteilung vorzunehmen. Nach der Einteilung der meisten Forscher in der U. S. S. R. lassen sich die Kindergemeinschaften leicht in fünf Typen unterscheiden, zwei Arten von spontanen und drei Typen von organisierten Gemeinschaften.

Die Grundhypothese, von der wir beim Studium der Kindergemeinschaften ausgehen, ist die Annahme, dass ihr Verhalten durch exogene und endogene Reize bestimmt ist. Hier berühren wir nur den Gegenstand des einen Gemeinschaftstypus, der kurzlebigen, der spontanen Gemeinschaft.

Das Studium von Gemeinschaften in verschiedenen Teilen der Ukrain gibt konstante Angaben bezüglich der Vereinigungsdauer und Teilnehmerzahl. Die Dauer und die Grösse der Gruppe ist sowohl durch den Bestand der gesellschaftlichen Erfahrungen der in einer Gruppe teilnehmenden Kinder als auch durch den Entwicklungsgrad ihrer anatomischen und physischen Verhaltensmechanismen bestimmt. Das Verhalten der Gemeinschaft ist durch das Milieu der Kinder und durch die Quelle ihrer Erfahrungen bestimmt.

Der Einfluss der Führer wurde in 50 bis 75% der untersuchten Gemeinschaften festgestellt.

Das Wenige, was wir aus den hier berichteten Untersuchungen über Kindergemeinschaften wissen, versetzt uns immerhin in die Lage unerwünschte Vereinigungen zu eliminieren und wünschenswerte durch das Bereichern der Kindererfahrungen hervorzurufen. Dies zeigt die praktische Bedeutung, die im Studium der Kindergemeinschaft liegt.

SALUSKY

PERSONIFICATION OF IDEALS BY URBAN CHILDREN*

From the University of Alabama

DAVID SPENCE HILL

SOURCES AND CORRELATIONS

The movement to build anew the curricula for moral education, illustrated by the efforts of Charters (6), is a forward step in that vague field. Charters' technique for curriculum-building is essentially of threefold nature, namely: (a) to ascertain by consensus, or otherwise, the desired *traits*; (b) to ascertain the different *situations* in which these traits are manifest or needed; and (c) to identify the various *activities* within the respective situations discovered. Upon the basis of the activities, a curriculum is to be written, in order that by practice in these activities so designated youth may become habituated in the desired traits.

Common sense revolts against the idea of any mechanized technique, or procedure, used as a general formula for curriculum-building, but the undertaking of Charters and his disciples is far better, perhaps, than our traditional dependence upon either exhortation or punishment to acquire, in some undefined way, desirable qualities of human nature denoted merely by certain abstract terms. Improved contemporary procedure, however, is not free from the difficulty of dealing with concepts. The procedure is based inevitably upon the listing of traits denoted by concepts, and traits do not have standardized names, and identical forms of conduct or activities are denoted by different names of traits, a difficulty that Charters readily admits.

For example, *cheerfulness* may mean gaiety, or jollity, or gladness, or joyfulness, or happiness, or optimism. *Initiative* may mean ability to start a project, or it might mean ability to both start and to carry through to success. Nevertheless the intangibility of personality and the sheer difficulty of defining it, save by ambiguous concepts, have not deterred investigators, ancient and modern, from cataloging the

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abstract qualities desirable in character, as witness Aristotle's (1) happy means, Franklin's 13 virtues (8), and the recently compiled Hutchins (13) code of 10 traits.

Persons are more interesting to youth than concepts, and perhaps the essence of hero-worship is that our habits and our hopes take a form strongly modified by the mental images of those persons who are what we are not, or who possess what we crave but have not. The same principle may explain in part the acute interest today in biography, autobiography, and character sketches.

Obviously more tangible and simple for educational purposes than are abstract terms, mere names of qualities, is the concrete personification of ideals, although few human beings probably could indicate with certainty and with constancy that person whom they would most like to resemble. It would seem that today, amid the welter of effort to modify our school curricula and courses of studies, it is worth while to revive the earlier attempts to ascertain just what persons, or images of personalities, are actually in the minds of youth when boys and girls are called upon to designate their *ideals* and to defend their particular choice of characters for emulation; and to ascertain what, if any, is the correlation between the sources of the ideals chosen and age, sex, and general development.

The objects of the present study therefore are twofold, namely, first, to ascertain the *trends* of differences between ideals selected by urban boys and girls, respectively from *immediate* and from *remote* environment in relation to *age* and *sex*; and, secondly, to ascertain the *content*—the names of the personages—of the ideals so designated.

The study utilizes returns from 8813 white children selected from the enrollment of the public schools of the three largest cities of Alabama, i.e., Birmingham, Montgomery, and Mobile. The populations involved comprise an overwhelmingly large proportion of the native-born, of Scotch, Irish, and English descent.

The data represent a fair sampling process for the much larger group of pupils enrolled, from the second grade through the high schools, in the three urban communities. The information was obtained on printed forms and written in by the children under the direction of teachers carefully instructed to avoid suggestion. The form includes questions regarding *occupation of father, birthplace, age, grade*, but this present study utilizes only this one first question printed thereon, namely:

1. Of all persons whom you have heard, or read about, or seen, whom would you most care to be like or to resemble? Why?

The question is practically identical with the one used in the European and pioneer American studies (2, 4, 5, 7, 9, 10, 11, 12). Some of the earlier attempts made to ascertain the ideals of school children were characterized by too much reliance upon conclusions drawn from data necessarily crude. The nature of this work, which exacts reactions from children under the artificial conditions of the classroom group, renders it inadvisable to apply exact methods of quantification, and the interpretations utilized must be rightly limited to the discovery of general trends rather than to the discovery of minute, individual differences in reactions. The effects of temporary interest, of accidental suggestions, and of the set of the mind caused by the environmental conditions of the moment affect the results.

THE TREND

It is a problem, however, to what extent these returns gathered from 8813 children are thus seriously affected in relation to the predominating reactions caused by differences of age and of sex, as well as by the enlarging, objective stimuli to which the growing child is exposed. For example, a given pupil might name as his ideal on today a prize-fighter, and on tomorrow he might name a president, but in both cases he characteristically reacts to *remote* environment rather than to *immediate* environment made up of parents, relatives, friends—two different types of reaction affected largely by age and by intelligence.

Without exception, all the studies which we have examined offer distributions by chronological ages. It seems reasonably certain that if distributions were made according to mental ages, the resulting general trends would be considerably modified. The present study also shows the conventional distributions by chronological age (last birthday), and the results are contrasted with some earlier studies of this kind. The unusually large number of cases comprising our tables, of course, tend to smooth the "curves" of distribution.

About 3% of the papers were rejected as vague or imperfect. The responses of 8813 pupils were tabulated by *age*, and by *sex*, according to the sources of types of ideals named by the children, that is, ideals from *immediate environment* (father, mother, teacher, acquaintance); ideals from *remote environment* (historic American, historic foreigner, contemporary public character); characters from *fiction*

TABLE 1
SOURCES OF IDEALS CHOSEN BY URBAN CHILDREN FROM THREE CITIES

	All ages	Age in years										16	17-20
		6-8	9	10	11	12	13	14	15	16	17-20		
Numbers													
Boys	4199	320	349	390	438	466	575	542	516	323	280		
Girls	4614	343	387	382	424	551	673	693	556	362	243		
Both	8813	663	736	772	862	1017	1248	1235	1072	685	523		
Percentages													
Characters from immediate environment	19.9	43.4	32.0	27.3	26.1	16.3	13.9	13.2	13.3	11.9	11.0		
Historic and public characters	46.5	72.1	56.0	48.7	44.3	42.1	43.4	40.3	40.7	45.7	47.0		
	33.8	58.2	44.5	37.9	35.1	30.0	29.8	28.5	27.5	29.8	27.4		
Characters from fiction	70.5	43.4	56.5	62.1	62.3	76.4	76.6	78.6	79.4	79.7	77.2		
Characters from religion	45.1	21.7	34.4	44.0	47.1	48.6	48.2	53.5	50.1	43.4	42.3		
Miscellany	57.2	32.3	44.9	53.0	54.7	61.3	61.3	64.5	64.2	60.5	61.3		
	3.1	2.8	3.6	4.9	5.6	1.5	4.0	2.4	2.0	1.6	2.8		
	2.5	1.7	3.8	2.1	2.4	3.7	2.7	.7	3.1	3.3	2.9		
	2.8	2.2	3.7	3.5	3.9	2.4	3.3	1.4	2.5	2.5	2.8		
	1.8	2.8	1.9	2.2	2.1	1.8	1.7	.6	1.0	2.4	2.1		
	2.1	3.2	3.6	1.0	1.4	3.1	2.1	1.7	1.4	1.3	2.8		
	1.9	3.0	2.4	1.7	1.7	2.6	1.9	1.5	1.3	1.8	2.4		
	4.8	7.0	6.0	4.5	5.8	4.6	3.8	4.6	4.0	5.3	6.4		
	3.8	1.7	3.0	2.0	4.7	4.4	3.5	2.4	4.5	6.3	7.4		
	4.3	4.2	4.2	3.9	5.2	4.5	3.6	3.3	4.3	5.8	6.8		

(literature, the stage); and *religious personages*. Table 1 discloses the combined results in accordance with this analysis, in condensed form.

Considered separately, the sets of data from the three cities comprise actually three experiments under the respective conditions existing therein. Since the populations involved are overwhelmingly native-born and quite homogeneous, therefore differences in the percentages under the various headings are probably due more to the objective or environmental conditions rather than to any pronounced differences in race or individual development. Table 2 sets forth the comparative results from the three cities of Alabama.

The factors comprising the four types, or sources, of ideals in Tables 1 and 2 have been made the subject of more detailed analysis

TABLE 2
DISTRIBUTION OF IDEALS AMONG 8813 WHITE CHILDREN IN THREE CITIES

Environment		Birmingham	Montgomery	Mobile
Immediate	Boys	9%	21%	14%
	Girls	41	50	40
	Both	26	37	28
Remote	Boys	75	66	70
	Girls	47	41	49
	Both	60	53	59
Fiction	Boys	3	4	3
	Girls	2	4	1
	Both	2	4	2

TABLE 3
PERCENTAGES OF IDEALS CHOSEN FROM IMMEDIATE ENVIRONMENT

		All ages	6-8	9	10	Ages in years					15	16	17-20
Number						11	12	13	14				
Parents as Ideals													
Boys	331	8	18	14	12	10	8	5	5	4	3	4	
Girls	687	15	19	18	18	14	16	14	13	12	15	14	
Both	1018	12	19	16	15	12	12	10	9	8	10	9	
Teachers as Ideals													
Boys	63	1.5	2	1	2	2	1	1	1	3	1	2	
Girls	663	14.5	19	18	13	14	14	13	13	14	15	16	
Both	726	8.21	10	10	7	8	8	7	8	9	8	9	
Acquaintances as Ideals													
Boys	356	9	21	13	9	12	6	6	6	6	7	4	
Girls	672		28	15	14	14	10	14	12	13	15	15	
Both	1028	15	25	14	12	13	9	11	9	10	11	9	

for each of the three cities, but our space does not permit us here to reproduce in full the elaborate tables thus formed.

In *immediate environment*, father or mother, teacher, or acquaintance are the important elements. In case of the first (parents), there seems to be a diminishing influence, so far as these returns are affected, in the boys. Girls, at all ages, idealize both parents and also teachers more than do the boys. Table 3 sets forth the separate results thus found.

In like manner separate analyses have been made for ideals from *remote environment*, that is, from historic and contemporary public characters. Table 4 shows in condensed form three of these groupings.

TABLE 4
PERCENTAGES OF IDEALS CHOSEN FROM REMOTE ENVIRONMENT

	Number	All ages	6-8	9	10	Ages in years						
						11	12	13	14	15	16	17-20
Historic Americans												
Boys	1441	34	22	33	39	22	45	39	32	35	27	32
Girls	771	17	15	21	21	23	23	15	15	10	9	10
Both	2212	25	18	27	30	28	34	26	22	23	17	22
Contemporary, Public Americans												
Boys	1380	33	18	19	19	26	29	35	43	41	52	43
Girls	1066	23	5	11	19	17	21	27	33	32	24	25
Both	2446	28	12	15	19	22	24	31	38	36	38	35
Foreigners, Historic and Contemporary												
Boys	131	3	3	5	4	3	3	2	4	4	1	2
Girls	242	5	2	2	4	7	5	7	5	5	9	8
Both	373	4	2	4	4	5	3	5	5	5	5	5

It appears from Table 4 that more boys than girls, at every age, idealize American personages, deceased or contemporary. Contemporary public characters markedly affect the choices of the boys. Small numbers idealize foreigners, historic or present-day.

Table 1 shows that relatively small numbers of boys and girls select ideals from fiction—about 3% so choosing. Not indicated in this table are the further facts that most of the characters so selected (26%) are derived from reading, and less than 1% (0.2%) are derived from the imaginary characters portrayed on the screen. These characters, however, are to be distinguished from the actors themselves who are frequently emulated (included in *contemporary* characters).

Low percentages of ideals are selected from the field of religion

(God, Jesus, Bible characters, ministers, etc.). Table 1 shows that only from 1 to 3% of the pupils so chose.

THE CONTENT

Turning now to the *content*, or the names of persons designated as ideals, we have the lists compiled as tables.

Of American characters, historic and public and contemporary, Washington, Lindbergh, Lincoln, Lee, Wilson, and Edison seem to have captured the imagination of the greater number of boys. Forty-four per cent of the 4199 boys name some of these six great men, or altogether, 1819 boys. The choices of the majority of the boys cover a wide range—the full list being shown in Table 5.

TABLE 5
AMERICAN HISTORIC AND PUBLIC CHARACTERS
NAMED BY 2821 BOYS AMONG 4199

No. of boys	Percentage	Characters named
2821	67.0	All characters
725	17.0	Washington
608	15.0	Lindbergh
154	4.0	Lincoln
145	3.5	Lee
107	3.0	Wilson
80	2.0	Edison
65	1.5	Babe Ruth
53	1.3	Ford
38	.9	T. Mix
35	.8	T. Jefferson
33	.7	Tunney
27	.6	Roosevelt
22	.5	D. Fairbanks
21	.5	Coolidge
21	.5	Red Grange
19	.4	B. Franklin
19	.4	E. Wells
18	.4	Byrd
16	.3	D. Boone
16	.3	Longfellow
13	.3	Rockefeller
12	.2	Dempsey
11	.2	Stonewall Jackson

The following names, to be included as part of Table 5, were mentioned by some 500 different boys, in each instance from 1 to 10 times. The list, therefore, is indicative of the range, or variety, of

such ideals chosen rather than that any one of the persons named have influenced more than 10 boys among the 4199 boys.

Audubon	Goethals	Morgan
Austen, G.	Gorgas	Maitland
Alexander	Graves, Gov.	McManus
Bigelow	Grant	Novarro
Blue	Grange	Ochs
Brown, J. Mack	Hall, N.	Oglethorpe
Bell, B.	Haines	Perry
Brandon	Halliburton, R.	Poe
Burbank	Hamilton, A.	Pickford, J.
Bullock	Harding, Pres.	Pickard
Candler, A. G.	Hobson	Putnam, I.
Carson, K.	Hartwell	Ramsey
Chamberlain	Heflin, Sen.	Reed
Chaney	Holt	Revere, P.
Chaplin	Hoover	Rogers, B.
Clay, H.	Hopkins, J.	Rogers, W.
Cobb, Ty	Hoxie	Rosenfeld
Crockett, D.	Irving, W.	Semmes
Custer	Jackson, Chevalier	Sharkey
Darwin	Jackson, Andrew	Smith, Al
Darrow	Jennings	Spears
Davis, J.	Johnson	Steinmetz
Decatur, S.	Jones, Bobby	Stribling
DeForest	Jones, Buck	Tarkington
Dewey	Jones, J. P.	Taft
Dobbs	Jolson, Al	Tecumseh
Donahue	Keaton, B.	Twain, M.
Elder, Ruth	Kreissler	Tilden, B.
Emerson	Lewis, S.	Valentino
Forest, Gen.	Lloyd, H.	Webster
Fulton	Longfellow	Whiteman, P.
Gary	Marshall, J.	Whitney, E.
Gehrig	Martin, T. W.	Weissmueller, J.
Gibson, H.	Mayo	Young, G.
Glenn, Supt.	McMillan	
Gunter, Mayor	McAdoo	

Similarly, Table 6 contains the names of persons selected by the girls. Leading the list are Washington, Clara Bow, Lindbergh, Billie Dove, Ruth Elder, Clara Barton, Lincoln. It is to be observed that about one-third of the girls chose to be like male characters.

The following persons were named in each instance by some 370 different girls. (The record is part of Table 6.)

Adams, S.	Austen, J.	Brown, J. M.
Adoree, R.	Bernhardt	Burbank
Alexander, J.	Boone, D.	Cather, W.
Astor, M.	Bryan	Clay, H.
Atherton, G.	Brian, M.	Coolidge, Mrs.

Coolidge, Pres.	Griffith, C.	Pennington, A.
Cooper	Graves, Mrs.	Poe, E. A.
Costello	Graves, Gov.	Pocahontas
Crawford, J.	Grey, Z.	Pavlowa
Curie	Gunter, Mayor	Peggie, Baby
Daniels, B.	Glenn, Supt.	Priscilla
Davies, M.	Glenn, Mrs.	Ralston, E.
Darrow, L.	Gaeleiene, L.	Ramsey, E.
Day, A.	Hawthorne, N.	Rhinehart, M. R.
Dickerson	Hunter, L.	del Rio, D.
Dove, B.	Irving, W.	Rockefeller
Eddy, M. B.	Jackson, A.	Ruth, Babe
Etting, R.	Jackson, Stonewall	Schumann-Heink
Ederle, G.	Jackson, H. H.	Samson, Emma
Edison	James, Jesse	Shearer, N.
Emerson	Jefferson	Stowe, H. B.
Ferber, E.	Kress	St. Dennis, Ruth
Ford	Kreissler	Swanson, G.
Franklin	LaPlante, L.	Taft
Gabrilowitch	Lanier, L.	Talmadge, C.
Gale, Z.	Lewis, M.	Talmadge, N.
Gaynor, J.	Lindbergh, Mrs.	Taylor, R.
Goethals	Mayfield, Judge	Terhune
Glynn, E.	Miller, Patsy R.	Twain, M.
Guest, E. A.	Murray, M.	Tutwiler, J.
Galli Curci	Mix, Tom	Valentino
Gray, G.	Moore, Colleen	Washington, Martha
Garbo, G.	Navarro	Windsor, Claire
Darden, M.	Neilson	Willard, H.
Gish, L.	O'Neal, S.	Wilson, Lois

TABLE 6
AMERICAN HISTORIC AND PUBLIC CHARACTERS
NAMED BY 1837 GIRLS AMONG 4614

No. of girls	Percentage	Characters named
1837	40.0	All characters
367	8.0	Washington
207	5.0	Clara Bow
169	4.0	Lindbergh
118	3.0	Billie Dove
108	2.0	Ruth Elder
64	1.4	Clara Barton
60	1.3	Lincoln
57	1.2	Betsy Ross
42	0.9	R. E. Lee
39	0.8	M. Pickford
33	0.7	Longfellow
31	0.6	L. M. Alcott
31	0.6	Jean S. Porter
29	0.6	H. Keller
26	0.5	Marian Talley
21	0.4	Bebe Daniels
21	0.4	Martha Washington
17	0.3	Helen Wills
16	0.3	Woodrow Wilson
10	0.2	Molly Pitcher

Among 4199 boys, 131 name foreigners among historic and contemporary persons, as shown in Table 7. Columbus, Caesar, Napoleon, Pasteur, Tell, and Shakespeare lead the list.

TABLE 7
HISTORIC AND CONTEMPORARY FOREIGNERS AS IDEALS, NAMED BY 131 BOYS
AMONG 4199

No. of boys	Percentage	Characters named
131	3	All characters
23	0.5	Columbus
15	0.3	R. L. Stevenson
11	0.3	Caesar
8	0.2	Napoleon
6	0.1	Pasteur
5	0.1	W. Tell
4	0.1	Shakespeare
4	0.1	Roland
3	—	Charlemagne

Mentioned once or twice, in each instance, the following persons were named by some 50 of the remaining boys of this group:

Achilles	Drake	Lafayette
Albert, King	Doyle, C.	Richard, the Lion Hearted
Balboa	Fabre	Scott, W.
Bienville	Foch	Tennyson
Burns	Gainesborough	Verne
Caruso	George, King	Wagner
Cortez	Grimm	Whistler
Darwin	Haggard	William the Conqueror
DeSoto	Hannibal	Wordsworth

In like manner, Table 8 shows the foreign characters selected by 242 girls among 4614. Florence Nightingale, Joan of Arc, Paderewski, Shakespeare, Columbus, R. L. Stevenson, and Beethoven lead the list for girls.

Mentioned once or twice by some of the remaining 48 girls are:

Alexander the Great	DeSoto	Mozart
Alfred, King	Dickens	Napoleon
Angelo	Elizabeth, Queen	Newton
Bernhardt	Elliot, Geo.	Pasteur
Burns	Handel	Schubert
Caruso	Helen of Troy	Scott
Cary, P.	Hugo, V.	Terry, E.
Cavell, E.	Leonardo, D. V.	Wales, Prince of
Cromwell	Marie, Queen	Wagner
Charlemagne	Mary, Princess	Wordsworth
Chopin	Mendelssohn	

TABLE 8

HISTORIC AND CONTEMPORARY FOREIGNERS AS IDEALS, NAMED BY 242 GIRLS AMONG 4,614

No. of girls	Percentage	Characters named
242	5	All characters
65	1.4	Nightingale
45	1	Joan of Arc
18	0.4	Paderewski
13	0.3	Shakespeare
11	0.2	Columbus
10	0.2	R. L. Stevenson
9	0.2	Beethoven
6	0.1	Victoria
6	0.1	Liszt
4		Bonheur
4		Cleopatra
3		Caesar

Characters from fiction idealized by boys are indicated in Table 9.

TABLE 9

FICTIONAL CHARACTERS SELECTED BY 131 BOYS AMONG 4199

No. of boys	Percentage	Characters named
18	0.4	Robin Hood
12	0.3	Casey Jones
9		Crusoe
6		King Arthur
6		Tarzan
4		Beowulf
3		Sir Galahad
3		John Halifax

Mentioned once or twice by the 69 remaining boys:

Beau Geste	Percival	Hercules
Deerslayer	Sawyer, T.	St. George
Huckleberry Finn	Sigurd	Sherlock
Merriwell, F.	Dantes	

With few exceptions, the above imaginary characters interesting the boys are drawn from reading. Table 10 shows the results for the girls, 116 among 4614.

Mentioned once or twice by the remaining girls are:

Beowulf	Eyre, J.	Jack the Giant Killer
Brinker, H.	Frances, in <i>The Spy</i>	Judith
Cinderella	Gluke, in <i>Golden River</i>	Minerva
Crews, Sara	Halifax, John	

TABLE 10
FICTIONAL CHARACTERS SELECTED BY GIRLS

No. of girls	Percentage	Characters named
9		Joe, in <i>Little Women</i>
7		Pollyanna
6		Ann, in <i>Ann of Green Gables</i>
5		Elsie Dinsmore
5		Heidi
4		Beth, in <i>Little Women</i>
4		Lorna Doone
3		Little Colonel
3		Edna Earl, in <i>St. Elmo</i>
3		Robin Hood
3		Crusoe

SUMMARY

With due regard to the crudity of the data and with the reservations mentioned, the following summary of inferences from the materials at hand may be drawn:

1) *Concerning the apparent relations between age and sex, and the different reactions toward the general types of ideals:*

a) The largest number of ideals (57%) are selected from the field of *historic and public characters*. This includes historic Americans, historic foreigners, and contemporary persons of various kinds now in the public eye.

b) The influence of ideals from *historic and public* characters (remote environment) increases steadily from the age of 8 to the age of 15 years. Compare 32% with 64%.

c) At every age, boys, more than girls, select from *remote environment*. Compare 71% (boys) with 45% (girls), all ages combined.

d) 'Characters from *fiction* (literature and moving pictures) are selected by only about 3% of the pupils, all ages combined. The differences both with regard to sex and age are small and irregular, but, in general, a slightly larger number of girls than boys prefer characters from fiction.

e) About 2% of the pupils select ideals from among *religious personages* (God, Jesus, characters from Bible, ministers, etc.).

f) The second largest number of ideals (34%) are selected (all ages combined) from *immediate environment*, i.e., father, mother, relative, teacher, acquaintance.

g) The influence of such ideals (*immediate environment*) declines steadily from 8 to 15 years, the change being represented by the figures 58% and 28%.

h) At every age, girls, more than boys, select ideals from immediate environment. Compare 47% (girls) with 20% (boys), all ages combined.

i) Under the caption *miscellany* are included those pupils (4%) who designate an occupation instead of a person, or who reply that they would be "like themselves."

2) *In regard to the identity of the characters chosen by the pupils, in order to personify their ideals, the reactions of the group are as follows:*

a) Large numbers of the 8813 pupils select characters from the combined realms of history, biography, legend, contemporary journalism, and the stage (boys 67%, girls 40%, for American characters; boys 3%, girls 5% for foreign characters).

b) However, the main characters named are designated in each instance by very small groups of boys. There really is no consensus manifest (*American*—Washington, 17%; Lindbergh, 15%; Lincoln, 4%; Lee, 3.5%; Wilson, 3%; Edison, 2%; *foreign*—Columbus, 0.5%; Stevenson, 0.3%; Caesar, 0.3%; Napoleon, 0.2%; Pasteur, 0.1%).

3) A wide range of occupational types are shown by the choice of persons distinguished, respectively, as *statesmen, soldiers, explorers, aviators, scientists and inventors, actors and actresses, artists and musicians, athletes, financiers, physicians, philanthropists, capitalists, patriots, educators, and authors.*

Only one girl among 4614 girls denoted a certain recently escaped convict whom she would like to resemble because "no prison bars or laws could hold him."

CONCLUSIONS

The numerous excellent characters from history, literature, and contemporary life, found among the personages of whom the minority of pupils were thinking, if better delineated to larger groups of pupils by reading, story, and picture, might awaken more effective interest in history and biography, and help to build permanent habits of wholesome reading. Any interested teacher can easily ascertain what characters are predominant in the minds of pupils at a given time by repeating this study as a class or school experiment.

Characters selected from the pupils' lists chosen by teachers and parents and librarians could be made more vivid in the consciousness of a very wide range of pupils rather than in the minds of the relatively small groups who seem to know about them. It should be noted that Charters gives an important place to the *personification* of ideals in his strong program for the teaching of ideals in the schools.

In the meantime, in different parts of the country more extensive studies of the problems of ideals personified by youth might be undertaken advisedly in order to secure a sure ballast of facts.

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LA PERSONNIFICATION DES IDÉALS PAR LES ENFANTS URBAINS

(Résumé)

Les buts de cette étude ont été (a) de trouver les tendances des différences entre les idéals choisis par les filles et les garçons urbains, respectivement, du milieu immédiat et éloigné dans ses rapports avec l'âge et le sexe et (b) de trouver le contenu—les noms des personnages—des idéals ainsi désignés. On a eu des données de 8813 enfants de race blanche de trois villes à l'égard de la question suivante: De toutes les personnes dont vous avez entendu parler, ou dont vous avez lu, ou que vous avez vues, auxquelles aimeriez-vous mieux vous ressembler? Pourquoi?

Les résultats montrent que le plus grand nombre d'idéals sont choisis dans le domaine des personnages historiques ou des personnes de la vie publique; que l'influence de ces personnages s'accroît constamment pour les enfants entre l'âge de 8 et de 15 ans; que les garçons, plus que les filles, choisissent des idéals du milieu éloigné. Les personnages de la fiction ne sont choisis que par 3% des élèves, les personnages religieux par seulement 2%. Le deuxième grand choix d'idéals est du milieu immédiat (père, mère, professeur, etc.), cette influence devenant de plus en plus petite pour les enfants âgés de 8 à 15 ans. Les filles, plus que les garçons, choisissent des idéals du milieu immédiat.

Il se montre une grande variation dans le type des idéals, montrée par le choix des personnages distingués, respectivement, comme hommes d'Etat, soldats, explorateurs, aviateurs, hommes de science et inventeurs, acteurs et actrices, artistes et musiciens, gymnastes, financiers, médecins, philanthropes, capitalistes, patriotes, éducateurs, et auteurs.

HILL

PERSONIFIKATION DER IDEALE VON STADTKINDERN

(Referat)

Der Zweck dieser Studie war (1) die Unterschiede in den von Stadtkindern—Knaben und Mädchen—gewählten Idealen zu ermitteln—ob aus der nächsten Umgebung oder nicht, auch mit bezug auf Alter und Geschlecht der Kinder; und (2) die Namen der Personen, die diese Ideale vorstellen, zu erfahren. Man stellte 8813 weissen Kindern die folgende Frage: "Welcher von allen Personen, von denen du gehört oder gelesen hast, oder die du gesehen hast, möchtest du am liebsten gleichen? Warum?"

Die Ergebnisse zeigen dass die meisten Ideale der Geschichte oder dem öffentlichen Leben entnommen waren; dass der Einfluss dieser Persönlichkeiten stetig zunahm bei Kindern von 8 bis 15 Jahren; dass Mädchen, öfter als Knaben, ihre Ideale aus der nächsten Umgebung wählten. Nur 3% der Schüler entnahmen ihre Ideale der Dichtung und nur 2% wählten religiöse Helden. Die zweitgrösste Wahl fiel auf die nächste Umgebung (Vater, Mutter, Lehrer, usw.), dieser Einfluss nahm jedoch stetig ab bei Kindern von 8 bis 15 Jahren.

Eine grosse Mannigfaltigkeit der Typen der Ideale zeigte sich in der Auswahl von Männern die sich als Staatsmänner, Soldaten, Forschungsreisende, Flieger, Naturforscher und Erfinder, Schauspieler und Schauspielerinnen, Künstler und Musikanten, Athleten, Financiers, Ärzte, Philanthropen, Kapitalisten, Patrioten, Pädagogen und Schriftsteller ausgezeichnet hatten.

HILL

RACIAL DIFFERENCES: THE DOGMA OF SUPERIORITY*

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Much controversial literature has appeared in reference to racial differences in intelligence. The status of this problem was well summarized by Estabrooks (14), who stated that the investigation of racial differences in intelligence is at present hopeless, since we are unable (*a*) to eliminate environmental differences, (*b*) to identify "races," and (*c*) to define intelligence.

Estabrooks' position is similar to that of Yoder (68), who recently discussed certain studies of racial differences.

"It may be correctly concluded that the consensus of competent scientific thought, contemplating the inability of mental testers to define intelligence, the inadequacy of all attempts to take such factors as education, social status, and language into proper consideration and the deficiencies of testing conditions, finds no proof of racial inferiority or superiority and eliminates the usual methods of determining such standing from the field of scientific usefulness" (p. 470).

The above views coincide with that expressed by Miss Burks (7).

". . . . differences are important to know about but almost no studies of this type provide any means for evaluating the contributions of nature or nurture. The contribution of the low testing races or nationalities is generally inferior to that of the high testing ones, but we do not know whether this environmental difference is a cause or an effect. Until we can have controlled experiments upon children of various races *transplanted at infancy* into uniform environments, precise knowledge regarding crucial native differences may be impossible to secure" (p. 282).

The preceding opinions have been literally forced upon practically everyone who has examined the vast array of data which has been accumulating during the past decade. It is of interest briefly to review the data which have brought a distinct change of front on the part of many psychologists. When the results of the Army Alpha

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Tests were first published, C. C. Brigham (4) analyzed the scores of foreign-born recruits. He found that the most recent immigrants made lower scores than earlier immigrants and concluded that the more recent immigrants were therefore less intelligent than those who came to America at an earlier date. Various critics pointed to the vitiating effect of language handicap and interpreted Brigham's finding merely as an indictment of the tests which purported to measure intelligence. Needless to say, the controversy aroused widespread interest.¹

After the development of a more refined technique for measuring intelligence, zealous and persistent attempts were made to eliminate or to make allowance for the effect of factors such as education, social status, language difficulty, temperamental traits, etc., upon the intelligence test scores of various groups.

LANGUAGE HANDICAP

Mead (39) found that intelligence test scores of Italian children were influenced by (*a*) the language used at home, (*b*) the social status of the children, and (*c*) the length of time that the fathers of the children had been in this country. This last element was somewhat interwoven with the language factor. In another article, Mead (38) asserted that "a methodology adequate to deal with racial and nationality testing has not even been born" (p. 658).

Wang (63) studied the test results of 34 Chinese students at Ohio State University. The Chinese students were equated with 34 native-born American students upon several bases, including percentile standing in the Ohio State University Intelligence Test (Forms 3 and 4). On Test 5, a test of number series which involves comparatively little knowledge of English, the Chinese were decidedly superior to the Americans. Since the Americans made superior scores in the tests requiring a marked knowledge of English, and made lower scores than the Chinese students upon tests involving a minimum of English usage, Wang concluded that he had obtained clear evidence that the language handicap vitiated the results of verbal intelligence tests and made comparisons of races by means of such tests spurious.

¹It is of interest to know that Brigham (5) now states that one of his later studies upsets completely his earlier analysis of the samples of the foreign-born in the white draft. It is unfortunate that retractions rarely receive wide publicity. Brigham's retraction will probably be no exception to the general rule.

Graham (27) studied 73 Chinese children all of whom were 12 years of age. On tests requiring the least knowledge of English the Chinese children earned their best scores. Graham, therefore, was led to a conclusion similar to that of Wang.

"The results of our investigation show a decided language disability in the case of the Chinese, which is so complex that it cannot be localized by partialing out various language elements" (p. 68).

Porteus and Babcock (49) compared the scores of Japanese, Chinese, and white children upon intelligence, general scholarship, and English tests. They found that the white children were superior to the Japanese children in the English tests, much superior in intelligence, as measured by the Thorndike Test, and inferior in general scholarship (p. 121). A part of the superiority in scholarship may have been due to the persistence, determination, and industry of the Japanese children. It may have been, however, that the white children's superior scoring on the Thorndike Test was due in part to their greater familiarity with English.

By means of the Stanford-Binet test, Darsie (9) studied more than 500 Japanese children and compared their test scores with those of white children. He found the inferiority of the Japanese to be confined largely to the definitely linguistic elements of the scale. Where the verbal element was minimized or absent, the performance of the Japanese approached or surpassed that of American children (p. 84).

Other so-called "races" have been compared, and sweeping conclusions have been drawn regarding their intelligence, character, etc. There have been, however, careful attempts to equate language handicap, social status, etc. Notable among such efforts is the use of "performance" or non-language tests of intelligence in studying "races."

Koch and Simmons (35) found that rural white children excelled city Negro and Mexican children on the National Intelligence Test, a distinctly linguistic test. On the Myers Pantomime Intelligence Test, however, a paradoxical situation was revealed; both the city Negro and the city Mexican children surpassed the rural whites in the scores made upon this test.

Sandiford (53) found that the use of non-language tests raised the intelligence rank of Indians considerably above that secured by verbal tests (p. 368). From the results of non-language tests, Pintner and Keller (48) stated that differences in the scores of foreign and American children upon verbal tests were unreliable and inaccurate measures of the true intelligence differences. Children who spoke a

foreign language at home tested relatively lower upon revisions of the Binet tests than upon tests which require a minimum knowledge of English. Pintner (46) studied also the test performances of Polish, Italian, and German children.

"All reports indicate the inferiority of the Italians on all kinds of intelligence tests, but the writer is inclined to believe that the discrepancy between the groups as usually shown by means of verbal tests over-emphasizes greatly the intelligence difference between Italians and Americans" (p. 295).

Not only are the test results affected by the amount of knowledge of English required by the test; they are influenced appreciably also by the particular racial samplings which are used. Pintner (47) recently objected to the practice of studying foreigners in this country and assuming that representative samplings of various races have been secured. One can never be sure that the foreigners are a genuinely unselected group. Pintner states that it is only by testing adequate samplings of national groups *within their own countries* that one may approximate true knowledge of racial or national differences in intelligence (p. 376). He asserts also that it is impossible to make any really valid comparisons of races by translating tests from one language into another and comparing test results. It is obvious that the language handicap remains, even when such efforts are made; the comparisons are made unreliable, in addition, because of the failure of testers to equate the social status of the races or of the samplings of the races which are studied.

SOCIAL STATUS

The preceding studies suggest that social status must be taken into account if true racial differences in intelligence are to be brought to light. One of the first students to attack this problem was Miss Arlitt (1), who used as subjects 191 children of native-born white parents, 87 of Italian, and 71 of Negro parents. The median *I.Q.*'s of these three groups were 106.5, 85, and 83.4 respectively. These data suggest very marked racial differences; when Arlitt equated her subjects, however, on the basis of social status, the median *I.Q.* of the offspring of native-born white parents fell to 92.

"It is apparent that such differences as we have between the Negro and Italian children and between these and children of native born white parents are not nearly so striking as the differences between children of the same race but of different social status. Of the two factors social status seems to play the more important part" (p. 182).

Certain investigators have found significant differences between Americans of different social or occupational status. Such investigations have been accepted by some as true evidences of differences in the *innate ability* of the groups studied.

Terman (60), in 1916, reported that 492 children who were classified by their teachers in five groups according to social status varied in *I.Q.* in the following significant manner. The median *I.Q.* of those of the superior social class was about 7 points above the average, and the median *I.Q.* of those of inferior social status was about 7 points below the average (p. 72).

Others, however, have insisted that the differences in the average scores of different social and economic groups are the result (in part at least) of the opportunity of the various groups to learn the tasks presented by the test. They hold that a low social status restricts opportunity. Therefore, they insist that the differences between the groups of Americans are effected by one of the factors that produces differences between the races which are studied in America. Pyle (51) studied Chinese and American children and concluded:

"In a recent unpublished study of all the rural school children of a Missouri county, the mental development of rural children was found to be much farther below that of city children than the difference here found between Chinese and these same American city children. This means that the racial differences, as shown by these tests, are much less than that between rural and urban American white children" (p. 269).

The experimental studies cited above lead to conclusions similar to those expressed by a number of sociologists. This change in attitude on the part of psychologists and educators becomes increasingly significant if one recalls the dogmatic statements which were made regarding racial differences about 10 years ago. The following quotations from Boas and Edman (13) are indicative of an attitude prevalent among certain students of social phenomena.

"We are not inclined to consider the mental organization of different races of man as differing in fundamental points. Although, therefore, the distribution of faculty among the races of man is far from being known, we can say this much: the average faculty of the white race is found in the same degree in a large proportion of individuals of other races, and although it is probable that some of these races may not produce as large a proportion of great men as our own race, there is no reason to suppose that they are unable to reach the level of civilization represented by the bulk of our own people (p. 201). (Citation from Boas, quoted by Edman.)

"The fact remains that there are, despite the lack of evidence for hereditary mental differences, practical differences in the mental activity

of different races that are of social importance. These differences, which seem so fundamental, have been explained primarily by the powerful control exercised over the individual by the habits which he acquires even before the age of five years. These, though unconscious, may be, as the Freudian psychologists maintain, all the more important for that reason. This would appear to be the only explanation of significant racial difference" (13, pp. 201-202).

Not all psychologists were guilty of oversimplifying the problem of racial differences. When Yerkes (66), in 1915, published his Point Scale Revision of the Binet tests, he included, among his findings, data relating to the social and racial status of the children tested. He concluded that "conditions which are in part describable as sociological are correlated with differences in intellectual performance which may amount to as much as 30 per cent of the total" (p. 82). He remarked further, "In view of this fact, which our results amply demonstrate, it is obviously unfair to judge by the same norm of intelligence two children, the one of whom comes from an excellent home and neighborhood and the other from a medium to poor home and neighborhood" (p. 9).

Colvin and Allen (8) also pointed to the fact that many testers ignore the preceding principle. "All intelligence tests yet published (1923) are valid in showing differences in mentality when, *and only when*, those tested have had common experiences and similar interests" (p. 9).

EDUCATION

Discussion of the present topic under headings such as language handicap, social status, education, etc., is obviously an arbitrary procedure. This classificatory scheme is, of course, a matter of convenience rather than of logic. It will be convenient at this point to cite a few studies which seem to indicate the influence of education upon alleged racial "differences."

Davis (10) studied the relation between the amount of school training and the intelligence scores of Negroes. For grades VIII to XII, the median *I.Q.* of Negroes was 78, but the median number of months that these Negroes had been in school was only 70. Normally, the median *I.Q.* of white children in these same grades would be 100, but the median months of school attendance for the white children would be also proportionately larger than the median of the Negroes. Because of this fact, one, of course, cannot know whether the mental rating difference is a cause or an effect of restriction in

educational opportunity. Because the amount of school training received by the two races differs appreciably, Davis believes that different norms should be employed for appraising the mental capacity of different groups.

The writers have assembled data which indicate to them that purported race differences in native intellectual capacity may be due to something other than inherent capacity. They have studied the Army Alpha scores of northern Negroes as compared with the scores of southern whites (64). Table 1 shows the percentage of *whites* from four southern states who reached or exceeded the median Army Alpha score of Ohio Negroes.

TABLE 1

State	No. of whites	Percentage of whites who reached or exceeded the median (49.30) of Ohio Negroes (152 cases)
Mississippi	665	39.25
Kentucky	832	41.34
Arkansas	618	41.42
Georgia	702	40.74

The simple, natural, and obvious conclusion to be drawn from the above figures is that educational opportunity is probably a potent force in affecting mental test scores. It is obvious, of course, that the *educational opportunity* of the whites in the above states (Mississippi, *et al.*) is decidedly restricted and that the educational opportunity of the Ohio Negro is exceptionally *salutary*². Educational surveys of the several states have brought this fact clearly to attention.

In many school systems segregation of the races is practiced in the elementary grades. In the high school and in college, however, Negroes and whites are often enrolled in the same classes. Here the restricted educational attainment of the Negro presents an almost insurmountable burden when group instruction is attempted.

The starting-point for remedial work and further experimentation involves an accurate knowledge of the educational status of representative Negro pupils enrolled in the elementary schools. Herein is a

²The sectional difference in educational opportunity is well illustrated by the state laws relating to compulsory education. The last state in the union to adopt such a law was Mississippi, in 1918. Ohio, on the other hand, is the only state in the union that requires as much as 12 years regular school attendance.

comparative study of the educational attainment of Negro and white children selected from the elementary schools of Coffeyville, Kansas (64).

The Stanford Achievement Test, Form A, was given to 1725 white and 220 Negro pupils of chronological ages 7 to 13, inclusive. Children of these ages were selected in order that a representative sampling of each race might be obtained. The composite score upon the entire examination and its equivalent educational age were obtained for each child. Table 2 shows the number of months that the median educational age of white children exceeded the median educational age of Negro children at each age level.

TABLE 2
AVERAGE NUMBER OF MONTHS WHITE CHILDREN EXCEEDED NEGRO CHILDREN
IN EDUCATIONAL AGE AT EACH CHRONOLOGICAL AGE LEVEL

C.A. in years	E.A. difference in months
7	8.0
8	14.3
9	14.0
10	17.0
11	17.0
12	25.3
13	27.4

It is apparent from Table 2 that the white children exceeded the Negro children in educational age at every age level. Particularly salient is the fact that the younger Negro children reached more nearly the educational status of the white children than the older ones.

The number of months by which the median educational age of the entire group of white children exceeded the median of the Negro group was found to be 16.7. Only 14.5% of the Negro children reached or exceeded the median educational age of the white children.

The above findings suggest that educational opportunity may be limited progressively for the Negro as he remains in the white man's school. When educational opportunities are made really equal for races, and when social barriers are not insurmountable, the "inferior" races sometimes have been found to make rapid progress in the types of development and adjustment which reflect true intelligence. Porteus and Babcock (49) present data which substantiate this hypothesis. They found in Hawaii that the grandchildren of Chinese coolies did fully as well as American children upon intelligence tests.

They attributed this finding to the fact that the coolies' descendants were subject to the influence of free schools.

Between 1865 and 1886 about 33,000 Chinese coolies were taken to Hawaii. A much smaller number of Chinese migrated to Hawaii from California. The rapid rise of the Orientals in educational and social status suggests that environmental factors are of utmost significance in determining racial progress.

"The fact that in one or two generations the descendants of coolie labourers, imported under contract to do the most arduous and unskilled work in the cane fields, are filling high school and university classes, gaining records in scholarship equal to those of the sons and daughters of a highly selected and intelligent group of whites, and making their way by every possible loophole of opportunity into the skilled professions—surely this seems like the strongest proof that, given educational advantages, even the poorly endowed racial groups may make their way, despite all handicaps of colour, custom and language. The selective conditions that existed in the pioneering days of Australia, Canada, and other new lands have no parallel in Hawaii. In these countries there was a decided choice of the most vigorous, alert and ambitious of the population to form the vanguard of settlement. No such selective factors operated in the case of contract labourers. The tests for choosing such labourers were three—bare feet, calloused hands and ignorance of English. The first test indicated an ability to endure hardships, the second a readiness to do hard work, and the third desideratum ensured that the worker, for a time at least, would not come under the influence of labour agitators. But the gist of the whole matter lies in the fact which we have tried to demonstrate throughout this book—that these barefooted, horny-handed, ignorant labourers *were not* poorly endowed, but were rich in an inheritance of temperamental or psychosynergic traits that only needed the opportunity to make their weight felt in inter-racial and social competition. From what we have said about contract labour it is plain that the conditions were only slightly better than those of the American Negro under slavery—yet what a difference in racial achievement" (pp. 307-308).

A study has been completed recently at the University of Kansas which is very pertinent in any consideration of racial differences. Mitchell (40) gave the following tests to three groups of 100 children each, classified in Grade 5A of the schools of San Antonio: (a) Pintner Non-Language Mental Survey; (b) McCall Multi-Mental, Form 1; and (c) Pintner Educational Survey. All tests were given during a single week. It is important to bear in mind the fact that the children all were classified in 5A. Mitchell believes the data are somewhat representative of the general standing of the three racial groups in San Antonio.

The data given in Table 3 indicate the general trend of Mitchell's data. The table presents the status of the three groups as indicated by the results of the assembly of tests used.

TABLE 3
DATA IN REFERENCE TO RACIAL DIFFERENCES FOUND AT SAN ANTONIO

Test used	Percentage of Negroes and Mexicans reaching or ex- ceeding the median of the whites	
	Negroes	Mexicans
Pintner Non-Language Survey	10.0	13.0
McCall Multi-Mental, Form 1	5.3	7.08
Vocabulary—Pintner Survey Data	9.8	18.8
Arithmetic—Pintner Survey Data	5.0	11.0
Composite results upon Pintner Educational Survey	8.0	3.0

The composite results upon the Multi-Mental Test corroborate the data obtained by the Pintner Tests. G-score data are given by Mitchell, who found that the white children exceeded the standing of the Negro and Mexican children about two years in growth as measured by this test. The Mexican children made slightly better scores than the Negroes upon this test.

Although the hypothesis that racial differences in intelligence are inherited to a marked degree is a questionable one, the fact stands that practical differences exist in the mental activity and consequent educational accomplishment of different races in this country. Undoubtedly, social and educational barriers are important factors in effecting differences. This was demonstrated in the study of Porteus and Babcock. Mitchell asserted that the Negro and Mexican children whom he studied were handicapped by home conditions, lack of knowledge of English, poorly trained teachers, and social attitudes. All factors seem to operate to produce poor results in school work. The social attitudes and values are of utmost importance in evaluating mental and educational attainment. These factors produce what are sometimes called differences in temperament—subtle and elusive differences which have been neglected or discounted usually by testers in the past.

TEMPERAMENTAL DIFFERENCES

Klineberg (34) compared 120 full-blood (or almost full-blood) Indians with 110 white children and reported that the white children

were quicker in completing certain performances, but that the Indian children made fewer errors (p. 274). Klineberg described this peculiar race difference in the following way.

"The white boy jumps at the puzzle. . . . He completes the test in 66 seconds but he has made 14 errors in the process. The Indian boy moves slowly, deliberately; he seems to think each move twice over. . . . He sees no need for hurry. He takes 137 seconds to complete the tests. A poor performance apparently but he has not made a single false move" (p. 274).

"Looking at the results of the whole group we find that in the Healy A test, for example, the *time* record shows lower medians for the whites at eight ages out of ten, and the record for *moves* shows lower medians for the Indians of 9 ages" (p. 274).

"The emphasis on speed, which seems to be one of the salient characteristics of modern American life, has apparently not penetrated the cultural pattern of the Indian" (p. 275).

The preceding finding suggests that, in the words of Symonds (59), "We had better cast away our old blanket conception of racial superiorities and consider superiority rather in terms of separate functions or groups of functions" (p. 442). The suggestion of Symonds is substantiated by Darsie's (9) study of *specific* differences between Japanese and American subjects. Darsie found that the Japanese children were superior to American children in mental processes involving acuity of visual perception and recall and also tenacity of attention (p. 85).

A finding analogous to those of Darsie and of Klineberg was reported by Walcott (62), who found that Chinese students were slower in completing certain tests than the American; the Chinese students, however, made fewer errors than Americans. Walcott also reports other interesting race differences, i.e., the Chinese students could repeat numbers backward better than forward (p. 476). Here, indeed, is a conundrum for the mental tester who wishes to attack the problem of racial differences in intelligence.

It seems apparent that temperamental differences among the races are of vital importance to the intelligence tester who desires an accurate picture of racial differences.

"One difficulty that we met was the unwillingness of the Orientals to attempt tests involving them in verbal expression of any length. The test situation differed entirely from that of the school where the answer could be so often given in the words of the book or of the teacher. There was evident an unwillingness on the part of the children to commit themselves to an answer unless they were quite sure of the purport of the tests. Mis-

trust of the examiner's purpose rather than misunderstanding of the test itself was the important feature to them. Hence several tests which on *a priori* grounds might be expected to be applicable did not work at all well" (49, p. 221).

An example of the type of test question that led to mistrust on the part of the Orientals is one contained in the Stanford-Binet test. The subject is asked to give the similarity between a snake, a cow, and a sparrow. The practical-minded Orientals frequently met this question with the remark, "I think you fool me."

"Japanese children did not give the impression that they were the equals in mental alertness of the Chinese, but that they owed their success to a better temperamental balance. The Chinese were much more expressive as regards their emotions, failure being accompanied in some cases by very evident signs of distress and disappointment. But where the mistake seemed to teach the Japanese child prudence, it often served to confuse the Chinese child so that it was more likely to make another in consequence" (49, p. 299).

Such considerations as the foregoing have made it necessary for the critical student to adopt the position of such writers as Estabrooks, Yoder, and Boas. Garth (22), who for years has been assigning *I.Q.*'s to different races, now admits that there is some doubt whether conventional intelligence test results are fair to Negroes, Mexicans, and Indians. Brigham (5) also admits that his early statements regarding the foreign-born in the white draft are of little validity. This surely makes it almost certain that the dogma of racial differences in innate capacity was premature and unwarranted.

Nevertheless, certain present-day workers continue to pile up the sort of data that is presented in Tables 4-11. A few workers still seem to assume that they are measuring actual race differences in inherent capacity. It is, of course, true that the type of data that is presented in Tables 4-10 has value. The differences that appear in the races in various kinds of attainment are of utmost significance for the schoolman. The starting-point of remedial work posits an accurate knowledge of the educational status of foreign pupils enrolled in the schools. Such data are, however, unconvincing when they are employed to bolster up preconceived notions of *racial differences in innate capacity*. For the determination of such differences, it is, of course, the quality, as well as the quantity, of data that is essential.

For the present it may be said, therefore, that (*a*) individual differences among the members of a given race are always much larger³

³Since the individual differences within a given race commonly range from idiocy to genius, this proposition is not a surprising one. It is scarcely conceivable that the gap between the median intelligence scores of any so-called races could be greater than this.

TABLE 4
SOME RESULTS OF TESTS APPLIED TO NEGROES

Reported by	Test employed	Locality	Date reported	No. of cases	Median or mean <i>I.Q.</i>	Percentage reaching or exceeding median of whites
Mayo	(37) School records	New York City	1913	147	*	Only 30%
Ferguson	(15) Battery of 4 tests	Va.	1916	1,000	*	Only 20 to 25%
Pressey and Teter	(50) Pressey	Ind.	1919	187	83.0 (?)	Only 30%
Murdock	(42) Pressey	New York City	1920	229	*	Only 30%†
Schwiegler and Winn	(55) Stanford-Binet	Kan.	1920	58	89.2	Only 12%
Derrick	(11) Stanford-Binet	S. Car.	1920	55	103.0 (Mn.)	Only 16.4%
Yerkes	(65) Army Alpha	U. S.	1921	25,000	*	Only 27%
Haggerty	(28) Delta 2	Va. cities	1921	976	*	Only 14.3%
	(28) Delta 2	Rural Va.	1921	2,100	*	Only 19.9%
Arlitt	(1) Stanford-Binet	Penna.	1921	71	83.4	*
Jordan	(33) National Intelligence	Ark.	1922	247	75.0	Only 20 to 26%
Pintner and Keller	(48) Modified Binet	Ohio	1922	71	88.0	*
Barnes	(2) Stanford-Binet	Kan.	1923	210	84.6	*
Thorndike	(61) I.E.R.	Northern U. S.	1923	349	*	Less than 4%
Peterson	(45) Pressey and others	Tenn.	1923	314	75.0 (Mn.)	*
Sunne	(58) National Intelligence	La.	1924	1,112	*	Only 10 to 31%
	(58) Myers Mental Measure	La.	1924	1,113	*	Only 12 to 40%
Garth and Whatley	(25) National Intelligence	Tex.	1925	1,272	75.2	*
Witty and Decker	(64) Stanford-Achievement	Kan.	1926	228	*	Only 14%
Goodenough	(26) Goodenough	Southern U. S.	1926	613	78.7	*
	(26) Goodenough	Calif.	1926	69	85.8	*
Hirsch	(30) Pintner-Cunningham, Dearborn A and C	Tenn.	1926	449	84.6	*
Patrick	(44) Otis	Ga.	1926	47	*	Zero per cent
Strachan	(57) Stanford-Binet	Mo.	1926	905	93.45	*
Davis	(10) Terman	Southern U. S.	1928	222	78.0	*
Mitchell	(40) Pintner Non-Language	Tex.	1928	100	*	Only 10%
	McCall Multi-Mental	Tex.	1928	100	*	Only 5.3%
	Pintner Survey: Vocabulary	Tex.	1928	100	*	Only 9.8%
	Pintner Survey: Arithmetic	Tex.	1928	100	*	Only 5.0%

*Data lacking.

†Only 30% of the Negroes reached or exceeded the median of 489 Hebrews.

TABLE 5
SOME RESULTS OF TESTS APPLIED TO INDIANS

Reported by	Test employed	Locality	Date reported	No. of cases	Median or mean <i>I.Q.</i>	Percentage reaching or exceeding median of whites
Rowe	(52)	Mich.	1914	268	*	†
Hunter and Sommermier	(32)	Kan.	1922	711	*	†
Garth	(20)	Okla. and N. Mex.	1925	1,050	68.6	*
Fitzgerald and Ludeman	(16)	S. Dak.	1926	83	87.5	*
Sandiford and Jamieson	(53)	Ont.	1928	289	80.0	Only 10%
		Ont.	1928	295	97.0	*
		Ont.	1928	114	92.0	*
		Ont.	1928	59	78.0	*
Pintner and Keller	(48)	Ohio	1922	1	93.0	*
Lima	(36)	Minn.	1928	*	107.0	*
Goodenough	(26)	Noopa Valley	1926	79	85.6	*
Sheldon	(56)	*	1924	*	83.0	**
Garth and Garrett	(24)	U.S. (scattered)	1928	1,022	69.6 (Mn.)	* (U. S. Indian School)
		Okla.	1928	291	72.5 (Mn.)	* (Public School)

*Data lacking.

†Only 5.8% of the Indians tested at age or above.

‡The whites excelled the Indians by 1.6 *P.E.* of the latter.

**Computations made by employing the data of Rowe and Garth.

TABLE 6
SOME RESULTS OF TESTS APPLIED TO CHINESE

Reported by	Test employed	Locality	Date reported	No. of cases	Median or mean <i>I.Q.</i>	Percentage reaching or exceeding median of whites
Yeung	(67) Modified Stanford-Binet	Calif.	1921	109	97.0	*
Symonds	(59) Pintner Non-Language	Hawaii	1924	513	99.3 (Mn.)	*
Sandiford and Kerr	(54) Pintner-Paterson	Vancouver	1926	224	107.4	71%
Murdoch	(43) National Intelligence	Hawaii	1925	58	†	*
Goodenough	(26) Goodenough	Calif.	1926	25	104.1 (Mn.)	*
Porteus and Babcock	(49) Modified Binet	Hawaii	1926	212	91.0 (Mn.)	*
	Porteus Form and Assembling Test	Hawaii	1926	276	98.0 (Mn.)	*
Hoag	(31) National Intelligence	Hawaii	1926	727	86.89 (Mn.)	*
	Morgan Test, and Indiana Mental Survey					
Porteus and Babcock	(49) Porteus Maze Test	Hawaii	1926	388	92.2 (Mn.)	*

*Data lacking.

†National Intelligence Test mean score was 166.47.

TABLE 7
SOME RESULTS OF TESTS APPLIED TO JAPANESE

Reported by	Test employed	Locality	Date reported	No. of cases	Median or mean <i>I.Q.</i>	Percentage reaching or exceeding median of whites
Bere	(3) Stanford-Binet Stanford-Binet Stanford-Binet	Calif. Calif. Calif.	1924 1924 1924	198 215 143	99.2 87.6 86.3	(Large cities) (Smaller towns) (Smallest towns and rural schools)
Murdoch	(43) National Intelligence	Hawaii	1925	61	*	+
Sandiford and Kerr	(54) Pintner-Paterson	Vancouver	1926	276	114.2	80%
Goodenough	(26) Goodenough	Calif.	1926	42	101.9	*
Fukuda	(17) Stanford-Binet	Colo.	1923	43	97.0 (Mn.)	*
Porteus and Babcock	(49) Modified Binet	Hawaii	1926	229	84.0 (Mn.)	*
	Porteus Form and Assembling Test	Hawaii	1926	338	101.2 (Mn.)	*
Hoag	(31) National Intelligence, Morgan Test, and Indiana Mental Survey	Hawaii	1926	2,141	81.33 (Mn.)	*
Porteus and Babcock	(40) Porteus Maze	Hawaii	1926	406	99.4	*

*Data lacking.

†Probably computed by employment of Darsie data. See (9).

‡National Intelligence Test mean score was 159.42.

TABLE 8
SOME RESULTS OF TESTS APPLIED TO MEXICANS

Reported by	Test employed	Locality	Date reported	No. of cases	Median or mean <i>I.Q.</i>	Percentage reaching or exceeding median of whites
Young	(65) Army Alpha and Beta	Calif.	1922	51	87.5	Only 10 to 14%
Garth	(21) National Intelligence	Tex.	1923	305	83.0	*
Sheldon	(56) Stanford-Binet and Cole-Vincent	N. Mex.	1924	100	89.0 (Mn.)	*
Dickson	(12) Stanford-Binet	Calif.	*	37†	78.0 (Mn.)	*
Goodenough	(26) Goodenough	Calif.	1926	367†	88.5 (Mn.)	*
Heilman	(29) National Intelligence	Colo.	1926	*	79.0	*
Garth	(23) National Intelligence	Tex., N. Mex., and Colo.	1928	1,004	78.1	*
Garretson	(18) National Intelligence, Pintner-Cunningham, and Myers	Pint-Ariz.	1928	117	*	†
	Pantomime					
Mitchell	(40) Pintner Non-Language	Tex.	1928	100	*	Only 13.0 %
	McCall Multi-Mental	Tex.	1928	100	*	Only 7.08%
	Pintner Survey: Vocabulary	Tex.	1928	100	*	Only 18.80%
	Pintner Survey: Arithmetic	Tex.	1928	100	*	Only 11.00%

*Data lacking.

†Spanish-Mexicans.

‡The Mexicans were retarded 10.53 months more than the whites.

TABLE 9
SOME RESULTS OF TESTS APPLIED TO ITALIANS

Reported by	Test employed	Locality	Date reported	No. of cases	Median or mean <i>I.Q.</i>	Percentage reaching or exceeding median of whites
Murdoch	(42) Pressey	New York City	1920	499	77.0 (Mn.)	†
Arlitt	(1) Stanford-Binet	Penna.	1921	81	85.0	*
Yeung	(67) Stanford-Binet	Calif.	1921	25	84.0	*
Young	(69) Army Alpha and Beta	Calif.	1922	*	83.0	Only 7 to 18%
Brown	(6) Stanford-Binet	Mich.	1922	51	77.5 (Mn.)	*
Pintner and Keller	(48) Modified Binet	Ohio	1922	313	84.0 (Mn.)	*
Colvin and Allen	(8) Binet	R. I.	1923	50	91.0 (Mn.)	*
	National Intelligence	R. I.	1923	50	76.0 (Mn.)	*
Bere	(3) Stanford-Binet	New York City	1924	100	83.0	*
Mitchell	(+) Stanford-Binet	New York City	*	89	83.0	*
Hirsch	(30) Pintner-Cunningham, Dearborn A and C	Mass.	1926	359	85.8 (Mn.)	*
Goodenough	(26) Goodenough	Calif.	1926	456	89.1 (Mn.)	*
Mead	(39) Otis	N. J.	1927	276	*	Only 7%
Lima	(36) *	Minn.	1928	*	95.3	*

*Data lacking.

†Only 15% of the Italians reached or exceeded the median of 489 Hebrews.

‡Unpublished data on examination of pre-school children. [Quoted in (3, p. 71).]

TABLE 10
SOME RESULTS OF TESTS APPLIED TO JEWS

Reported by	Test employed	Locality	Date reported	No. of cases	Median or mean I.Q.	Percentage reaching or exceeding median of whites
Murdoch	(42) Pressey	New York City	1920	489	98.0 (Mn.)	†
Pintner and Keller	(48) Modified Binet	Ohio	1922	79	95.0 (Mn.)	*
Bere	(3) Stanford-Binet	New York City	1924	100	95.0	*
Mitchell	(4) Stanford-Binet	New York City	*	93	93.0	*
Hirsch	(30) Pintner-Cunningham	Mass.	1926	75	102.8 (Mn.)	(Polish Jews)
	Dearborn A and C					
Goodenough	(26) Goodenough	Mass.	1926	627	99.5 (Mn.)	(Russian Jews)
Lima	(36) *	Calif.	1926	55	106.1 (Mn.)	*
		Minn.	1928	*	110.2	*

*Data lacking.

†Fifty-three per cent of Americans reached or exceeded the median of the Jews.

‡Unpublished data on examination of preschool children. [Quoted in (3, p. 71).]

TABLE 11
SOME RESULTS OF TESTS APPLIED TO GERMANS, FRENCH, AND ENGLISH

Reported by	Test employed	Locality	Date reported	No. of cases	Median or mean <i>I.Q.</i>	Percentage reaching or exceeding median of whites
(Germans)						
Brown	(6) Stanford-Binet	Mich.	1922	67	102.3 (Mn.)	*
Pintrner and Keller	(48) Modified Binet	Ohio	1922	37	91.0 (Mn.)	*
Hirsch	(30) Pintrner-Cunningham, Dearborn A and C.	Mass.	1926	190	98.5	*
Goodenough	(26) Goodenough	Calif.	1926	29	101.1 (Mn.)	*
Hoag	(31) National Intelligence, Morgan Test, and Indiana Mental Survey	Mor-Hawaii	1926	17	88.97 (Mn.)	*
Lima	(36) *	Minn.	1928	*	101.1	*
(French)						
Brown	(6) Stanford-Binet	Mich.	1922	199	95.4 (Mn.)	*
Pintrner and Keller	(48) Modified Binet	Ohio	1922	1	125.0	*
Hirsch	(30) Pintrner-Cunningham, Dearborn A and C	Mass.	1926	243	85.3	(French-Canadians)
Goodenough	(26) Goodenough	Minn.	1926	*	104.2	*
(English)						
Brown	(6) Stanford-Binet	Mich.	1922	90	101.8 (Mn.)	*
Pintrner and Keller	(48) Modified Binet	Ohio	1922	24	97.0 (Mn.)	*
Moore	(41) *	*	*	*	100.0	*
Goodenough	(26) Goodenough	Calif.	1926	*	111.2	*
Hirsch	(30) Pintrner-Cunningham, Dearborn A and C	Mass.	1926	213	100.7	*
Hoag	(31) National Intelligence, Morgan Test, and Indiana Mental Survey	Hawaii	1926	26	100.0 (Mn.)	*

*Data lacking.

than the so-called "race differences," and that, therefore, (b) any sweeping statement of the intellectual status of the so-called inferior races would be premature. Until qualitatively and quantitatively different types of data are assembled these two propositions will stand. In all probability they will stand for some time to come.

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LES DIFFÉRENCES DE RACE: LE DOGME DE SUPÉRIORITÉ

(Résumé)

En faisant subir les tests soi-disant d'intelligence à divers groupes de race différente, on a essayé avec zèle et persistance d'éliminer ou de tenir compte de l'effet de facteurs tels que;—handicap de langue, état social, éducation, traits du tempérament, etc. Ces essais n'ont pas eu beaucoup de succès.

Il est toujours vrai que le handicap de langue nuit aux résultats des tests verbaux d'intelligence et rend fausses les comparaisons des races au moyen de ces tests. D'ailleurs, la pratique d'étudier les étrangers dans ce pays et de croire qu'on a obtenu une bonne représentation des différentes races ne vaut rien.

L'évidence que nous avons montrée que quand les différentes races ont une opportunité égale de recevoir de l'enseignement, et quand elles peuvent franchir les barrières sociales, les races "inférieures" ont fait quelquefois des progrès rapides dans les types de développement et d'ajustement lesquels montrent une vraie intelligence.

A cause des faits cités en haut, plusieurs psychologues ont changé leur point de vue pendant les dix ans passés. Ils pensent presque tous à présent que le dogme de différences de races en capacité innée a été prématuré et injustifiable. On ne peut pas espérer actuellement d'étudier les différences d'intelligence entre les races parce qu'on ne peut:—(1) éliminer les différences de milieu, (2) identifier les "races", et (3) définir l'intelligence.

WITTY ET LEHMAN

RASSENUNTERSCHIEDE: DAS DOGMA DER SUPERIORITÄT

(Referat)

Beim Darbieten der sogenannten Intelligenzteste an verschiedene Rassen-gruppen bemühte man sich sehr, die Einflüsse solcher Faktoren, wie sprachliche Hindernisse, sozialer Stand, Erziehung, Temperament u.a. zu eliminieren oder in Rechnung zu ziehen. Diese Bemühungen hatten keinen besonderen Erfolg.

Es trifft noch immer zu, dass sprachliche Hinderungen die Ergebnisse der verbalen Intelligenzteste und der Rassenvergleiche vermittelt solcher Tests verfälscht. Dazu kommt, dass die Ausübung der Untersuchungen über Ausländer in unserem Lande und die Annahme, dass representative Auswahlen der verschiedenen Rassen gewonnen worden sind, nicht stichhaltig sind.

Die uns zur Verfügung stehenden Beweisstücke zeigen, dass wenn die

erzieherischen Gelegenheiten für verschiedenen Rassen wirklich gleich sind, und wenn die sozialen Schranken nicht unüberwindlich sind, die "inferiore" Rasse gelegentlich rasche Fortschritte in Entwicklungstypen aufweisen, die wahre Intelligenz voraussetzen.

Auf Grund der obengenannten Tatsachen haben viele Psychologen während des letzten Jahrzehnts ihre Front gewechselt. Es ist nun ziemlich allgemein anerkannt, dass das Dogma der Rassendifferenzen bezüglich angeborener Fähigkeiten verfrüht und unbegründet war. Die Untersuchung von Rassenunterschieden hinsichtlich der Intelligenz ist zur Zeit aussichtslos, da wir 1) Unterschiede des Milieus nicht eliminieren, 2) "Rassen" nicht identifizieren, und 3) Intelligenz nicht definieren können.

WITTY UND LEHMAN

SHORT ARTICLES AND NOTES

RURAL PREFERENCES IN MOTION PICTURES*

HAROLD ELLIS JONES AND HERBERT S. CONRAD

In a series of earlier articles (1, 2, 4) the writers have described the use of motion pictures in connection with community surveys, conducted for the purpose of obtaining psychological or sociological data. Field experience has shown the great drawing power of motion picture programs (particularly in rural districts), when a free entertainment is offered in return for community aid in the collection of data. The problems of selection of groups, motivation, and control of test conditions become relatively simple when a properly standardized technique is followed. The writers' first use of films, in rural New England, was for the purpose of attracting groups to a common center, where test and questionnaire data could be obtained during intermissions in an evening's entertainment. At a later stage, motion pictures became an integral part of the test program, supplying both verbal and pictorial content for a series of group measurements of mental status.

Whether pictures are employed as an auxiliary or as a main element in a survey, it is clear that their maximum usefulness can be developed only when they are adapted to the interests and preferences of the group which is being studied. These interests and preferences should be known in detail. "What the public wants" has never been accurately determined in any field of artistic production. In motion pictures (until recently, at any rate) there has been little incentive to chart the phenomena of public opinion, since it is possible to make a considerable commercial success with pictures which appeal to limited groups. The "public" is of course really composed of many different (but overlapping) publics. Popular taste, within these various categories, may be conceived as influenced by age, sex, geographic location, economic and social status, intelligence, educational level, and the degree of local sophistication. Invidious notions of "social distance," by contrast with other groups in the population, may also play an important part. In formulating opinions of what the "public" wants, it has been customary to rely upon data which are, in the first place, of obviously imperfect validity. Box office receipts reflect not merely the popularity of the picture, but also the success of the publicity campaign, seasonal factors, and the methods employed in distribution. The opinions of local exhibitors are influenced not only by direct observation, but also by traditional practices, and by considerations involving the rental cost of the films. The data from pub-

*The data represented in this report were collected as an incidental part of a rural survey project, supported by grants from the Social Science Research Council of Columbia University.

lished criticisms from fan mail, and from newspaper straw votes and popularity contests, are doubtless valid for the groups represented, but they involve a sampling error which is too great to permit application of the results to a new unselected group.

A commercial exhibitor can afford to give an occasional picture that is poorly liked, since his program may be balanced by some other more popular element, and in a series of programs he is almost sure to strike a satisfactory average. But a survey can not risk such empirical methods; the choice of pictures, for any given group, should if possible make use of a precise knowledge concerning interests and preferences. An unsuitable picture may do more harm than good, from the standpoint of test motivation.

This is illustrated by the writers' data from a Vermont village (Chelsea) in which "The Last Laugh" was shown, in a version without titles. The town selected for this experiment ranked the highest, by intelligence test criteria, in a sample of 19 communities in Vermont, New Hampshire, and Massachusetts. Two earlier exhibitions had been given, in the same hall, of pictures which met with great popular favor. A capacity crowd of nearly 200 were punctually in attendance; it was evident that they had come with every intention of enjoying themselves. That they failed to do this is indicated by results on a questionnaire.

In response to the question, "What do you think of this picture?" 41% replied that it was poor, bad, hard to understand, or for other reasons objectionable and disagreeable.

In response to the question, "Would you like to see more pictures of this type?" 67% were quite definite in saying "No." These unfavorable percentages would have been larger had not about 15% of the audience left during the performance, being unwilling to see it through. It is probable that the percentages would have been larger still, had not the film been cut and some of the more repetitious (and, from the standpoint of this audience, tedious) parts eliminated. Typical adult comments were: "This picture has no life at all"; "not enough plot"; "silly"; "too sad"; "slow action"; "no fighting, no excitement"; "too mixed up"; "the hero (Jannings) is too old"; "good acting, but no sense to the story."

This picture, which is one of the most intelligent and distinguished films of recent years, and which has won the nearly unanimous praise of critics, is evidently far out of the reach of a rural audience. Sophistication confuses them, and psychological nuances are either ignored or resented. They are accustomed to action rather than implication, objective events rather than emphasis upon motives and mental processes.

An observational study of the responses of rural and urban audiences to comedy reel episodes shows, in the former group, a franker and more boisterous delight for the slapstick types of situation (the mother-in-law and the banana peel, or the clown and the custard pie still represent nearly the most funny of all possible conjunctions). We are not here concerned with

the factors which determine this state of affairs; it may be merely because motion pictures, in the outlying districts, have thus far failed to cultivate deeper ranges of appreciation, and have left the popular taste at the level of psychological crudities. As a present fact, however, it may be accepted and utilized in planning the motion picture elements of a survey.

In a group of four rural communities of Vermont and New Hampshire, 200 answers were obtained to the question, "What kind of pictures do you like best?" Responses are classified as follows:

- "Action pictures" 58%
 47%, or nearly one half of the entire group, specified "Westerns."
 11% mentioned the headings of "adventure," "pictures full of pep,"
 "with life in them," "fast and exciting," "fight pictures," etc.
- "Educational pictures" 15%
 6% specified "educational," the remainder mentioning "historical pictures," "scenic," "geographic," and "travel," "historical and patriotic," etc. The persons in this group included a large proportion of women beyond the age of forty; it may be supposed that some of these indicated what they thought they ought to prefer, rather than their actual preferences.
- "Comedy" 10%
 This includes only those replies specifying comedy and nothing else. A large number answered "Western comedy," and these responses are classified under action pictures. Probably most of those in this group also belong in the first classification.
- "Artistic" 3.5%
 "Classical pictures," "well-known stories, like Ben Hur," "good dramas," etc.
- "Love stories"2%
- "Society pictures" 1.5%
- "Miscellaneous"
 "Cheerful pictures," "Country pictures," "Pictures with a good moral influence," etc.

The most striking result is the great predominance of emphasis on "Westerns." "Love stories" receive few votes, as such, partly because all pictures contain a love element of some kind, and partly because these audiences appear to regard the romantic feature as incidental rather than primary.

When the question was asked, "What picture do you like LEAST?" the great majority answered (usually with underscoring) "Society pictures."

It is interesting to discover that the peaceful New England farmer finds his chief satisfaction in stories of the frontier, while the life of Newport, Park Avenue, and Deauville fills him with boredom and resentment. A marked extrovert delight is shown in cowboy exploits; pictures by Hoot Gibson, Fred Thompson, and Buck Jones, which are regarded as poor box office risks on Broadway, are among the best sellers in Vermont.

It should of course be borne in mind that the questionnaire method, when used without supplementary checking, is open to criticism. The internal consistency of answers can be checked to some extent by asking the same

questions in different ways. One hundred thirty-three answers were obtained to the question, "What movie actors and actresses do you like the best?" The following rank-order was obtained: Tom Mix, Hoot Gibson, Harold Lloyd, Mary Pickford, Douglas Fairbanks, Buck Jones, and Thomas Meighan, with a scattering of votes for Fred Thompson, Richard Dix, etc. Tom Mix overtopped all competitors, receiving 25% of the votes, while Hoot Gibson, the next in line, received 13%. Mary Pickford was the only woman performer receiving more than three votes. It should be noted that while this poll involves a very small number of cases, it gives the opinions of an entire representative rural audience¹ and is hence of greater significance than a newspaper poll which may yield thousands of votes, but from an unknown sampling.

One other approach to this minor problem of internal consistency, was made by listing the names of ten male and ten female motion picture stars, with the instructions: "Of the following actors and actresses, make an S in front of the name of each one that you have seen, and L in front of each one that you especially like." The names were arranged in such a manner as to minimize any advantage which might be due to priority of position. The list of names was of course arbitrary, and to avoid being too long the names of several actors known to be popular favorites in these districts (such as Hoot Gibson) were purposely omitted. An attempt was made to choose representative names from various types of performance. The results are stated in terms of the number voting "seen," and the number voting "especially liked": we may take as a measure of approval the frequency with which a player is "especially liked," divided by the number of times he has been seen. The first ten names are placed below in a rank-order according to this preference ratio:

Name	Number voting "seen"	Number voting "especially liked"	Preference ratio
Tom Mix	202	101	.500
Harold Lloyd	167	80	.480
Gloria Swanson	171	82	.480
Norma Talmadge	152	69	.454
Douglas Fairbanks	183	82	.448
Mary Pickford	189	82	.434
Marion Davies	127	51	.402
Lillian Gish	152	59	.388
John Barrymore	100	38	.380
Charlie Chaplin	199	58	.291

The high position of Tom Mix and Harold Lloyd confirms the findings

¹Data on the representativeness of the survey samples may be found in (3).

by other methods; the only inconsistent result in this table is the relatively high rating given to Gloria Swanson. The low rating of Charlie Chaplin as compared with Harold Lloyd is also a consistent finding; the exuberant and relatively external type of comedy is more readily appreciated than the subtler and psychologically more complex situations developed by Chaplin.

It should be remembered that these records were obtained as an incidental part of a survey in rural New England in 1926. They are of course influenced by recency and frequency factors in the pictures locally exhibited during that period. The general conclusions, however, are supported by the writers' observations in over thirty exhibitions in rural New England, employing a wide range of pictures.

The conclusions may be summarized:

1) In the use of pictures for motivation purposes in a social survey, the choice of the picture is an important factor. Care is needed in adapting the program to sectional interests.

2) In the rural groups studied, a strong Puritanical tradition is still flourishing, and is no doubt one of the reasons for the adverse criticism of "The Last Laugh" and of Charlie Chaplin. Evil must be painted in murky colors, and the consequences of misdeeds must be clearly exposed. Sympathy with human weaknesses (as with drunkenness in "The Last Laugh") tends to be regarded as a shocking example of moral laxity.

3) The groups showed a dislike for pictures of farm life and of rural settings, unless these were explicitly "Westerns."

4) City and society pictures were unpopular.

5) Films of objective action, with plots at the dime novel level, but with wholesome and happy endings, were uniformly successful. Some of the parents objected that these were "too exciting," but the general tolerance for this type of excitement seemed to be somewhat elastic.

From the standpoint of more general problems in social psychology, as well as in relation to the specific aims of our survey, it would appear that the study of responses in motion picture audiences affords a fertile field for controlled investigation.

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THE PERSONAL EQUATION IN ETHICAL JUDGMENT

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In connection with the try-outs of a scale of emotional maturity, in preparation, there was occasion to request of ten judges well known to the experimenter the sorting of 157 situation-response items into eleven groups. The continuum under examination was the degree of emotional maturity in a hypothetical subject who should react as described to the given situation; the judge was permitted to define "emotional maturity" as he wished, provided no violence was done to the ordinary connotation of the words. The situations were of this sort:

59 *S* attaches considerable importance to the satisfaction of his desires, but realizes that they must frequently remain unsatisfied.

38 *S* cannot bring himself to harbor thoughts of his own death; struck with emotional panic at any reference to it.

145 *S* is clear-cut in his decisions; when relinquishing an objective he relinquishes or postpones it entirely, when retaining it he retains all of it without regret.

It was attempted to bring the individual deviations of the judges into relationship with their personal characteristics; while the results are not clear-cut, they seem to be of some suggestive value.

For each situation the median group was determined, no attempt being made to deal with intervals smaller than a complete group; thus the three situations cited above had the following distributions, 11 signifying the group with the lowest emotional maturity and 1 that with the highest:

	11	10	9	8	7	Group		4	3	2	1
(59)						6	5	3	5	2	
(38)	5	2	3								
(145)							1			3	6

The medians used were therefore 3, 10, and 1; these may be compared with later determinations on the same situations by 83 judges (professional psychiatrists and students of personality) of 2, 8, and 1 (nine instead of eleven groups being used in this later determination).

The deviation of each judgment from the median for the situation was then determined; it is with the characteristics of the ten populations of 157 deviations each that the present analysis deals. By the method of derivation, it should be noted, a positive deviation signifies that the judge in question estimated that the response described was "worse," i.e., betokened a lower degree of emotional maturity, than it turned out to be on the basis of the pooled judgments; and, conversely, a negative deviation signifies that the judge estimated the situation as "better" than it was. If any convenience in the reader's mind is served by such a usage, the

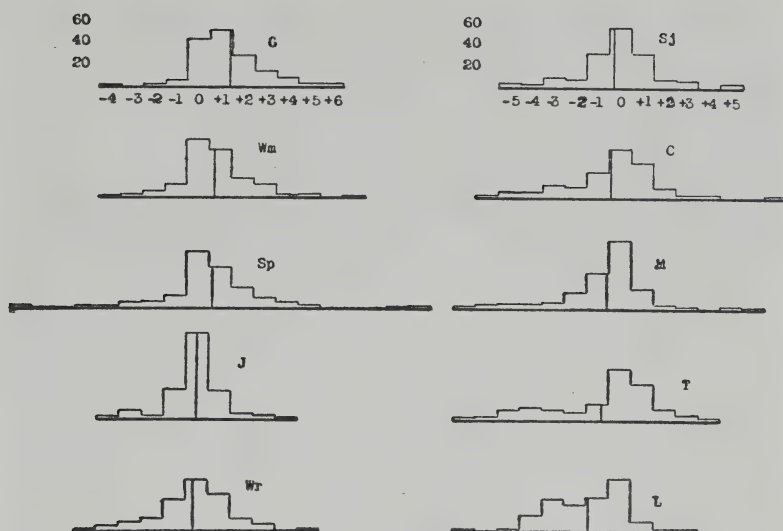


FIGURE 1

positive and negative deviates may probably be thought of without serious distortion as "pessimistic" and "optimistic," respectively.

Figure 1 presents the distribution graphically.

The statistical constants are as follows:

Judge	Mean	Sigma
G	+1.31	1.52
Wm	+ .78	1.71
Sp	+ .71	2.19
J	— .02	1.30
Wr	— .12	1.65
Sj	— .27	1.77
C	— .44	2.00
M	— .58	2.04
T	— .78	2.32
L	—1.43	1.60

The standard errors of the means ranged from .10 to .19, with an average of .14, and the standard errors of the standard deviations from .07 to .13, with an average of .10; a difference between means of about .4 and between standard deviations of about .3 may, therefore, be considered as probably real. The following differences fall in this category:

Means		Standard deviations	
Differences of	with	Differences of	with
G—all others		T—all except Sp	
Wm—all except Sp		Sp—all except T, M, C	
Sp—all except Wm		M—all except Sp, C	
J—all except Wr and Sj		C—all except Sp and M	
Wr—all except J, Sj, and C		Sj—all except Wm, Wr, L, and G	
Sj—all except J, Wr, C, and M		Wm—all except Sj, Wr, L, and G	
C—all except Wr, Sj, M, and T		Wr—all except Sj, Wm, L, and G	
M—all except Sj, C, and T		L—all except Sj, Wm, Wr, and G	
T—all except C and M		G—all except Sj, Wm, Wr, L, and J	
L—all others		J—all except G	

That is, four of the ten judges (T, Sp, M, J) are decidedly individual in both their biases and their degrees of certainty, having three or fewer similarities out of a possible nine; eight (all except Sj and C) are individual in their biases on the same basis, and five (T, Sp, M, C, J) in their degrees of certainty. The two lists given are in order from positive to negative, the means list being therefore a rank order of pessimism in the sense noted above.

The rank order correlation between means and score on Thurstone Personality Schedule shows traces of a negative relationship ($-.20$); this is raised to $-.29$ by the use of the product moment method. The suggestion, which small numbers make it impossible to confirm, is that the more pessimistic are the best adjusted, a formulation which would challenge interrogation. Information at hand on the characters of the judges is contradictory; G is a woman of 21, with a somewhat unprivileged background and not much cultural experience, but a formal education about equivalent to two years in college; her personality is adjusted and enthusiastic, her intelligence about 94th percentile college, and her Thurstone Personality Schedule score 24, the lowest of the group. It is conceivable that a rather religious background and relatively little experience with actual human personality may have resulted in the unquestionable bias shown toward rating the reactions as less mature than they were (in the sense explained). L, on the other hand, is a man of 25, finishing a Ph.D. problem in psychology, intelligence about 99th percentile college, personality noticeably schizoid, Thurstone score 75. It might be guessed in his case that a certain need to see the reactions of people in as favorable a light as possible (in order to make the world as livable a place as might be) and a broad experience of all levels of society had colored his judgments in the other direction. Such an interpretation would be supported by the fact that T is a woman of 23, intelligence about 86th percentile college, personality somewhat unstable emotionally, Thurstone score 91; but it breaks down upon observing that Wm has a Thurstone score of 92. She is, however, the sister of G, and for the first 21 years of her life was exposed to somewhat the same in-

fluences. The third from the top and bottom, Sp and M, respectively, have intelligence and Thurstone scores rather similar; both are mature women (about 50 and 35, respectively), but Sp's background is the rather rigorous one of an old New England family, while M's is warm, easy-going, and Virginian. The strong similarity of C and Sj in both measures is reflected in their temperaments, intelligence scores, and Thurstone scores (the latter being identical); although the former is a man and the latter a woman, they are of about the same age, of similar interests, and of a very similar placidity in their reactions to social situations. Wr and J are both professional psychologists, and possibly derive their common closeness to the median judgment from a certain practice in standardized judging, although Wr's Thurstone score is 105 and J's 26; Wr is a man about eight years older than J, who is a woman; J, Wr, C, and Sj are all mutually congenial and react in very similar terms to social situations; Sj is a daughter of Sp.

The correlation between Thurstone score and standard deviation is .29 by the rank order method and .13 by the product moment. This suggests that there is a negative relation between mean and standard deviation, which is true ($\rho = -.36$). That is, the larger the bias, the more uncertain is the judge (a graph suggests that this may operate in both directions, though this cannot of course be shown by the correlation). The association of this instability with that measured by the Thurstone score is suggestive; particularly so is the firm position of J at the bottom of the list, taken in conjunction with her deviation of $-.02$; she is evidently an especially capable judge on all grounds. The similarity in certainty between Wm and Wr may be related to the fact that for several years they have been in the habit of discussing personality topics with each other. The contrast between T at the most uncertain end of the scale and G and J at the other is strikingly borne out in their personalities and reflected in their Thurstone scores (T 91, G 24, J 26); there is no conspicuous difference in their intelligence. Sp and M are in a sense caught between two cultures, the former between old and new and the latter between north and south; on the other hand, there seems no obvious reason for the position of L, very similar in personality, Thurstone score, and intelligence to T.

A brief resumé of individual judgments absolutely greater than 5 will be of some interest; there are 22 of these. Only one situation seems to be influential of itself in producing these wide deviations:

S's daydreams represent him striving with and overcoming difficulties.

It was rated with a positive deviation of 7 by C and of 6 by G and M; none of these are addicted to habitual reverie, and it is probable that they regard such indulgence as diagnostic *per se* of emotional immaturity. The four judges probably most addicted to reverie (Wr, L, Wm, T) rated it with deviations of -1 , $+1$, -2 , and -2 , respectively. The other situations yielding wide deviations yielded them for only one judge each. By judges these are:

G: S is "scientific" in conversation; appears to regard others' viewpoints as specimens. (+6)

Being interrupted in the performance of an act, S returns to it at the earliest opportunity, giving evidence of discomfort at the diversion. (+6)

M: S is extremely solicitous of his children. (-7)

S is deprived of a much anticipated opportunity; he "resigns" himself to the change—i.e., is crushed, impressed with the fleeting character of human satisfaction, etc. (-7)

S is deprived of a much anticipated opportunity; he is emotionally crushed and incapable of further effort in any direction for a time. (-6)

S is subjected to public criticism, e.g., a reprimand from some person in authority or open adverse criticism of his actions; he collapses, shows signs of emotion and submission without defense. (-6)

S is extremely solicitous toward his younger siblings. (-6)

L: S is submissive in conversation; seems to be interested only in the attainment of others' satisfactions. (-7)

Sp: Upon threatened danger to person affectively near S, S is very anxious, cannot be at ease until he has worn himself out with endeavors, etc. (-8)

S is faced with an instance of violation of his mores; he is intellectually interested, without emotional shock, and seeks to discover what motives and satisfactions are involved from the standpoint of the violator. (+9)

S makes his plans with objective reference to his own death when this issue is involved; no emotional reaction greater than that, for instance, concerned in planning with reference to a journey. (+10)

S definitely disregards (without emotional disturbance) implications that he should take action on basis of folklore or superstition (defined as current belief unverified and inherently improbable.) (+10)

Wm: With younger person, S tends to withdraw from active participation in the group activity, and to observe younger person. (+7)

S is scrupulously tidy, placing neatness high among his major objectives. (+7)

T: S is troubled by night terrors or terror dreams. (-7)

S is deeply shaken by pain, giving the impression that a psychic as well as a physical factor is involved. (-7)

S's daydreams represent the reversal of situations humiliating in the real world. (-6)

S does not evince interest in why an action should be performed, feeling very strongly only that it should or should not. (-6)

S's daydreams represent him as in a place of honor, being ministered to by persons really his superiors without effort on his own part. (-6)

As brief descriptions of the outstanding features of the emotional adjustment of these persons, the above are excellent. To select only a few examples, G comes from the social level where to be "high-brow" is almost as culpable as to be intoxicated; L's whole social pattern is based upon timidity and compliance; Sp comes from a long line of New England ancestors; Wm finds orderliness cramping; T is impatient with rational approaches to ethical problems. More searching analysis would be possible, though unpolitic.

In summary, the examination of bias (individual mean deviation),

degree of certainty (standard deviation of deviations), and items with maximal deviation appears to offer some possibilities as a means of character estimation when used with items involving ethical judgment. In the present case, there are traces of a positive relationship between variability of judgment and emotional instability, and between emotional stability and a tendency to place items low in the scale. It is suggested as an appropriate generalization that, *ceteris paribus*, judges tend to estimate the value of conduct in others with reference to the standards they themselves have been able to maintain.

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A SOCIAL-PSYCHOLOGICAL VERSION OF THE AESTHETIC ATTITUDE

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Probably nearly all serious students of aesthetics would agree that the subject is not accorded recognition in college curricula, either in extent of courses offered or enrollment in such as are given, that is anything like commensurate with its real importance. James, you remember, called aesthetics the science of the useless; and to our puritan tradition, art and artists have never been quite respectable. Perhaps neither of these difficulties is of such great weight with present-day undergraduates as the supposed high-brow nature of the subject. It can hardly be denied that a good deal of unintelligible gush has been written concerning the arts, especially music. Such writing shows that critics as well as college students misunderstand the subject, and serves to justify the old prejudices against it. But aestheticians have themselves been largely responsible for this misunderstanding, owing to their unfortunate angle of approach to the subject. If the status of aesthetics is to be improved, we must approach it in a new way.

Aesthetics has commonly been treated in fragments—disjointed courses in history of the various arts, occasional offerings in technical training, especially in music, and perhaps a short course in aesthetic theory—with no fixed sequence of courses. In view of this situation, it is unfortunate that most texts on aesthetics take the existence of works of art for granted, and strike at once into the analysis of the aesthetic attitude. Since we find beauty in nature, and art is often inferior to reality, it is not unnatural that writers in search of examples of the aesthetic experience should include our response to nature, and even consider natural beauty as primary. But the resulting necessity to state the analyses of aesthetic experience in terms that will apply to our responses to nature as well as art has made the phraseology vague and abstract.

If, instead of beginning with analysis from the structuralist standpoint, we concern ourselves primarily with human behavior, the first problem becomes naturally that of the creation of art. Very little reflection on the nature of primitive art, the history of the arts, and the importance of tradition and convention in the arts of different regions, is necessary to show that the arts can be treated adequately only as social institutions. Without prejudice to other functions, we can safely say that all the arts are important as means of communication, commemoration, or accessories thereto. If we adopt communication as unifying concept, literature takes precedence over the other arts, and should certainly be given full recognition in any course in general aesthetics. Simple forms of the dance may not seem to fit in, but the social factor of display is evident, and the more elaborate forms, folk-dances such as the Morris-dance, processions, ballets, offer no difficulty. Architecture serves as setting for painting and sculpture, and in itself conveys the majesty of gods or kings and the dignity of bankers. Music is accessory to poetry, dance, and drama, and communicates emotion.

Suppose we take the term "aesthetic attitude" to refer primarily to the experiences involved in the appreciation of art, and consider a few of the familiar analyses from this standpoint. Although Parker uses the terms "aesthetic experience" and "beauty" as synonymous (cf. 3, p. 53), and the problems of the nature of beauty and of the aesthetic experience are obviously closely related, we may distinguish between the analysis of the experiences objectified as things of beauty, or ugliness, with the attendant discussion of the factors making for excellence in works of art, and the analysis of the process of appreciation. It is only the latter which concerns us here. As Professor Langfeld has selected for comment (cf. 1, Chap III) three outstanding treatments of this problem, it will be sufficient merely to mention Münsterberg's discussion of the aesthetic attitude, in contrast with the scientific, as complete absorption in and isolation of the object; Miss Puffer's "aesthetic repose," implying, like hypnosis and religious ecstasy, the loss of self-consciousness, and also involving a balance of impulses; and Dr. Bullough's "psychical distance." Miss Puffer (4, pp. 77-78) says, "the unity of a work of art makes of the system of suggested energies which form the foreground of attention an impregnable, an invulnerable circle. Not only, however, are we held in equilibrium in the object of attention; we cannot connect it with our self-background, for the will cannot act on the object of aesthetic feeling. We cannot eat the grapes of Apelles or embrace the Galatea of Pygmalion; we cannot rescue Orphelia or enlighten Juliet; and of impulse to interfere, to connect the scene with ourselves, we have none. But this is a less important factor in the situation. . . . The real ground of the possibility of a momentary self-annihilation lies in the fact that all incitements to motor impulse—except those which belong to the indissoluble ring of the object itself—have been shut out by the perfection of unity to which the aesthetic object . . . has been brought." Yet as soon as

we shift the emphasis and recognize as the essential feature of the situation the explicit knowledge on the part of the beholder that he has to do with a work of art; that in enjoying a picture he must not, as Münsterberg says, look beyond the frame, simply because there is no more to see; that if he is counting on the still life for his dinner, he will go hungry; that statues will not, outside of Don Giovanni, respond to greetings; that it is useless to hunt, like Garner's monkey, for the friend in the phonograph; that if he tries to rescue the heroine, he will be put out of the theater;—in short, that art is symbolic, a means of communication; then, we are ready, despite the obscurity and inconsistency of their negative statements (revealed by Professor Langfeld's discussion), to profit by the positive contributions of Miss Puffer and the other authors. The suggestions concerning the means of avoiding a confusion between art and reality—"preserving aesthetic distance"—given by various authors are of course none the less valid, but, since they usually involve arbitrary departure from reality, are more intelligible from the present standpoint than from one which makes natural beauty primary.

Any theory must come to terms with natural beauty. No one can deny that we are naturally interested in the sights and sounds of our environment. My view is that these native interests are not aesthetic; that the arts have been developed to meet needs of social life, chiefly for means of communication and preservation of tradition; that the contemplative response to works of art, the aesthetic attitude, which results from their artificial, symbolic character, induces attention to the qualities which make them effective or otherwise, and develops in the observer a sensitiveness to beauty, "that which pleases apart from desire," which can be manifested in connection with nature and situations of everyday life. The view will be justified if we can show that the aesthetic attitude is transferred from art to reality, that its exhibition in real situations is commensurate with the art experience of the persons concerned. Now, the attitude does not appear among the lower animals which lack any developed system of communication. When nothing in the environment invites overt response, the dog goes to sleep, the cow chews her cud. The farmer may enjoy the sunset, but is quite as likely to be interested in the indications of rain or fair weather on the morrow. Explicit recognition of transfer is common. How often we hear that some young lady is pretty as a picture, that some happening is dramatic, or just like a story, or, still more specifically, "That reminds me, etc." Interest in domestic architecture, beyond mere shelter, followed and borrowed structural methods and ornamentation from institutional architecture. Landscapes appeared in painting as setting for religious groups, processions, etc., and their independent treatment is comparatively modern, while landscape gardening is a very late development, only now coming into its own. Many persons like to take snapshots, but the majority tend to select subjects for their keepsake value, and technique of placement is commonly defective;

while the professional photographer covers a wide range of subjects which the public appreciates in picture form, though failing to realize their beauty in nature. Consider the effect of literature in broadening human sympathies, and especially the mitigation of our fear and dislike of the unfamiliar by the reading of books and magazines of travel, encouraging travel for enjoyment. We must not multiply instances. In every case, it is those familiar with the arts who devise new forms and widen the scope of their subject-matter. Tracing back to origins, we find the arts begin with magical practices, rituals, preservation of myths and legends, instruction of the young in traditions of social and economic life, etc. Aesthetic appreciation develops out of the response to the arts, and the trend of appreciation is from art to reality.

No rigorous test of the correctness of this opinion is yet possible. The problem calls for extensive research by genetic psychologists. Concerning the racial development, I am satisfied the view is valid. As regards individual development, we should, I think, since communication and the resulting sensitiveness to beauty go so far back in human history, recognize the possibility that in certain fundamental cases the aesthetic attitude may now be manifested without the necessity for any conditioning process, on a hereditary basis. The spontaneous babbling of infants, and the interest of both children and grown-ups in the quality of sounds seem to go beyond the limits of emotional expression regardless of any special musical training. Children's drawings, in particular their preference for a few stock subjects, as shown by statistical studies, may indicate the presence of innate interests in appearances. Woodworth's (5, pp. 181-182) discussion of feelings independent of the instincts applies here. The whole field is controversial, but there is little reason to suppose that heredity carries us far in the way of disinterested, aesthetic appreciation of nature. Far more promising is the evidence for inheritance of susceptibility for enjoyment of art, or, at least, capacity to profit by experience in production and appreciation of art, with marked individual differences in both the extent and the fields of such capacity. Recognizing, then, the possibility of minor exceptions, I hold to the validity of the theory for the individual as well as the race.

As a result of the special susceptibility due to inheritance and training, art for art's sake, the enjoyment of technique regardless of or even without meaning, becomes possible to certain individuals. To an aesthetics based upon social psychology such an extreme seems analogous to the behavior of the person wishing to fly who climbs out on a limb and saws it off. Enjoyment without foundation in normal human interests lacks permanence. In fact, we may suspect that these gifted individuals are really simply playing the game of follow my leader, that their real satisfaction lies in doing stunts beyond the capacity of ordinary mortals to imitate or understand. Legitimate art must have a meaning. In everyday communication, conversation, personal correspondence, newspaper reporting, etc., matter counts

for more than manner, though some deference is shown to "good use." In short-story and novel, public speaking, the movies, meaning and form of presentation are of more nearly equal interest. Most of the recognized masterpieces of art do not attempt to convey new information, or argue for new views concerning social problems. Their function is rather the embodiment of tradition. Hence the artists can concentrate upon perfection of technique. Since the response to the content of such art is merely the further confirmation of attitudes already accepted and practically dominant, admittedly a pleasant experience, and technical perfection is also pleasurable, it is possible on a hasty view to mistake the aim of art for mere amusement. But preservation of hard-won traditions, the maintenance of beliefs essential to civilized life, is more than amusement.

The meanings conveyed by art are thus subject to moral considerations.

This does not justify asceticism, nor imply that every work of art must "have a moral." It is more important that, by increasing our insight into life, and giving a view of life in the large, the arts widen the scope of self-consciousness. This suggests, by way of supplement to McDougall's discussion of the development of the self-regarding sentiment and the advance to the higher plane of social conduct (cf. 2, Chaps. VII and VIII), the addition of a final stage, beyond the avoidance of punishment and censure, beyond the stage of self-censure and control in conformity with the moral sentiments, beyond even the influence of the "aesthetic appreciation of the beauty of fine character and conduct" as he treats of it, and consisting in the living of a life in its entirety as a work of art. What higher ideal can be set for the striving of any man than that he shall be willing to see the game through, face his responsibilities, and meet them in such a way that later he will have no vain regrets over harm done to others or failure to achieve what lay within his power, so that, when the time comes, he can contemplate his life as a whole and feel that it was worth the living?

Our thought ranges beyond human life, beyond our environment as a means of satisfying our practical needs. In the attempts of science and philosophy to bring unity and coherence into our experience of reality in general the aesthetic motive is apparent. Whether the success of these attempts is such as to warrant conclusions concerning the nature of being is not for the psychologist to say.

Aesthetics, then, far from being the science of the useless, deals with fundamental phases of human culture, and should be given full recognition as an important branch of social science.

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BOOKS

MURCHISON, C. [Ed.] *The Foundations of Experimental Psychology*. Worcester, Mass.: Clark Univ. Press, 1929. Pp. x+907. [Contents: (1) The Mechanism and Laws of Heredity—T. H. Morgan; (2) The Study of Living Organisms—W. J. Crozier; (3) The Mechanism of Reaction—Alexander Forbes; (4) Vision: I. Visual Phenomena and their Stimulus Correlations—L. T. Troland; (5) Vision: II. The Nature of the Photoreceptor Process—Selig Hecht; (6) Hearing: I—H. Banister; (7) Hearing: II—H. Hartridge and H. Banister; (8) The Chemical Senses—George H. Parker and W. J. Crozier; (9) The Sense of Feeling—John Paul Nafe; (10) Space and the Non-Auditory Labyrinth—James Quinter Holsoapple; (11) Hunger and Thirst—W. B. Cannon; (12) Emotion: I. The Neurohumoral Basis of Emotion—Philip Bard; (13) Emotion: II. The Expressions of Emotion—Carney Landis; (14) Learning: I. Nervous Mechanisms in Learning—K. S. Lashley; (15) Learning: II. Experimental Studies of Learning—Walter S. Hunter; (16) The Individual in Infancy—Arnold Gesell; (17) The Individual in School: I. General Ability—Rudolf Pintner; (18) The Individual in School: II. Special Abilities and their Measurement—Frank N. Freeman; (19) The Adult in the Community—Mark A. May; (20) The Conflict and Survival of Cultures—Clark Wissler; (21) The Abnormal Individual—Shepherd Ivory Franz; (22) General Statistical Principles—Truman L. Kelley and Eugene Shen; (23) The Statistical Treatment of Certain Typical Problems—Truman L. Kelley and Eugene Shen.]

Is it merely an accident that the fiftieth anniversary of the founding of the first psychological laboratory should be marked by the appearance of the first *History of Experimental Psychology* (E. G. Boring) and by the most ambitious of all attempts to get the actual achievements of experimental psychology into a book (Murchison)? The reviewer believes that this double celebration of the anniversary is an accident, but he rejoices in the fact.

Murchison's book, or the book edited by him—though the editorial responsibility in such an undertaking is so great and so grave as to constitute something very near to authorship—is a very extraordinary achievement. In 1911, psychologists welcomed the orderly presentation of a vast array of experimental material in Woodworth's revision of Ladd's *Elements of Physiological Psychology*; in 1920, an even more ambitious compendium of information, Fröbes's *Lehrbuch der experimentellen Psychologie*, amazed the factually-minded student. Murchison, recognizing the value of such compendia of scientific findings, has asked a number of authorities to contribute chapters in which the achievements within various branches of experimental psychology are surveyed, with special emphasis upon the most

recent methods and results. The scope of the volume is suggested by the fact that 883 pages of text with 500 words to the page are required; that the Name Index, in small type, with three columns to the page, requires nine pages; that the references at the ends of chapters number over 1,500; and that the work is prodigal in cuts, graphs, tables, and formulae. The fact that such men as T. H. Morgan and W. J. Crozier have agreed to contribute articles on "The Mechanism and Laws of Heredity" and "The Study of Living Organisms" will at once arouse genuine excitement in the psychologist who is interested in the biological foundations of his science; and unless he already knows a good deal about the experimental and mathematical analysis of heredity and tropistic behavior he will feel something between bewilderment and awe upon discovering what has actually been done in the last few years.

It is the general characteristic of Murchison's book as a whole that the interrelations of biology and psychology are treated with very great competence. The authors are for the most part men of international reputation, and nearly all of them succeed very well in writing, if not for the intelligent beginner in psychology, at least for the advanced student without an elaborate technical vocabulary. To be sure, the mathematics are at times over the reviewer's head, but that is his fault and not the book's. If there is any one fault which holds for these more or less "biological" chapters as a whole, it is that there is a very natural tendency for the authors to stress the result of their own researches more than that of equally well-known men; but only in a few cases does any actual unfairness or suppression of contrary evidence appear.

The reviewer is, perhaps, somewhat arbitrarily, grouping together, as more or less definitely "biological," all the material on heredity, sensation, and reaction. At the other end of a curve one might place those aspects of psychology in which biological concepts have not as yet proven their predominant worth; I refer, of course, to the various contacts between psychology and the social sciences. Here one may include studies of "The Conflict and Survival of Cultures" (Wissler), "The Adult in the Community" (May), and "The Abnormal Individual" (Franz). From a study of these chapters one might quite reasonably conclude that the "experimental psychology" to which the book is dedicated has made little significant contribution to the understanding of man's social behavior. The very fact that Professors May and Franz are well-known for their experimental researches might trouble one the more, for if these experimentally-minded men cannot find experimental facts in these fields, why are the fields included within the domain of experimental psychology? But the answer is really not so hard to find. One might without undue captiousness point out that the editor of this immensely valuable book also shares responsibility for a *Journal of Social Psychology*, the subtitle of which suggests that the principal divisions of this field are "racial, political, and

differential psychology"—as if closing the door to that wealth of recent material in *experimental* social psychology which has in recent years been growing by leaps and bounds. In short, an editorial blind-spot of considerable magnitude has resulted in the omission of a very important experiment field; the subtitle of this journal shows why the *Foundations of Experimental Psychology* left out the necessary chapters on the *experimental* study of social behavior.

If one turns now to certain chapters which may be approached either from the biological or from the social science direction, one continues to find the same defect. Gesell's exceedingly interesting chapter on "The Individual in Infancy" seems posited on the proposition that biological individuality is a phenomenon of such purity and almost geometrical self-sufficiency that the interaction between children or between children and adults may be disregarded, as wholly irrelevant to child psychology. The Viennese studies of the social behavior of children, for example, get no attention at all, except in the list of references, and not much there. One might labor the point further, noting that the two chapters on emotion and the two dealing with "The Individual in School" almost completely ignore the interrelations between individuals. The question here is not the old, tiresome squabble as to whether individuals come before groups, or vice versa. It is the very simple and unmetaphysical fact that the individual is here treated as if social stimuli and social responses could be ruled out as disturbing variables with which the psychologist, as scientist, has nothing to do.

The book has one other serious shortcoming, but the reviewer does not know whether the author could have prevented it. This consists in the fact that the chapters are self-sufficing units, not only without articulation but sometimes with no common ground which the reviewer might use while working out his own articulation. The Subject Index probably exaggerates this water-tight-compartment plan of the book: *Learning*, for example, to which there are 65 references in the Index, is the subject of two chapters, and all but three of these references are to these two chapters. It is not true that learning is absolutely neglected elsewhere in the book. For instance, a reference to the conditioning of infants appears under the letter C but is without mention in relation to Learning. This is, by the way, the only mention of conditioning which appears in the Index, while the term *Response* is entirely missing; and among the various references to *Reflex* none contains the word *Conditioned*. Part of this is the fault of the Index; but it is true that there is no real discussion of Pavlov's work on conditioned reflexes anywhere in the book. This is an extreme case, but it shows what may happen when books are constructed by too many cooks, even when their competence is of the highest. Perhaps the very modern reader will be pleased to find *Instinct* mentioned only once in the Index, and *Reasoning* and *Thinking* not at all, but these omissions are not really

tributes to the modernity of the book, but merely to the fact that despite its huge size it omits a great many everyday laboratory problems. Most of the old standbys like Psychophysics manage to work their way in, here and there, but even among traditional experimental problems are some pretty large gaps. The almost complete neglect of experimental work on imagery, association, and higher mental processes (judgment, etc.), though justifiable from the standpoint of a psychologist of a frankly sectarian type, can scarcely be condoned in a work dedicated to the *Foundations of Experimental Psychology*, especially in view of this remarkable sentence in the Preface: "it is not likely that any fruitful problem has been omitted." The reviewer would be interested to know how many American psychologists could be found holding the common ground that neither association, imagination, nor thinking offers a fruitful problem. The editor is entitled to a personal opinion that the omitted problems promise "little return from experimental effort"; it is to be lamented that this personal opinion deprives us of a great deal which we might consider at least as rich in *experimental* findings as Wissler's excellent study of "The Conflict and Survival of Cultures."

And now we have done with the disagreeable business of proving that we are "critical," and can come back to the feast. For a feast it really is, with "the chemical senses" (42 pages) arousing our "hunger and thirst" (15 pages), and with all the refinements of experimental and mathematical method constantly appearing in new guise as we turn from "neuro-muscular evolution" to "fatigue," from "olfactometers" to "visceral sensitivity," from Goltz's spinal dog to the interpretation of facial expression, from the "transfer of training" to the method of "co-twin control." The best way for the reader to test the scope of the book is to take a list of a hundred names associated with important contemporary research, and look to see how well they fare at the hands of Murchison's authors. Such lists will naturally vary greatly, depending upon what one considers important. The reviewer has done this for himself, with the result that he finds 82 of his hundred names included and 18 omitted. In view of the rather large differences between Murchison and the reviewer with regard to the relative importance of various contemporary movements, this percentage of 82 must be considered remarkably high; one would have thought from the above strictures as to omissions that more than 18 per cent would be found wanting. A reader whose biases lie intermediate between those of Murchison and of the reviewer will probably find his own list duplicated in Murchison's Name Index to the point of 85 or 90 per cent.

While we are thinking of the importance of various names, it may be of interest to note who, according to Murchison's Name Index, are the most frequently cited of modern authorities. Thorndike has a very easy lead for first place, with 39 references to his credit (a reference here means the listing of a page on which his work is cited, e.g., a reference

like 620-622 counts as three references). Cannon, Sherrington, Helmholtz, and Adrian follow in the order named. (An exception to our method of counting must be noted in the case of Cannon, since the Index credits to him all the pages comprised in the chapter which he contributes to the volume. His tenure of second place is calculated from references to him by *other* authors.) The special emphases of our book—in particular, the emphasis on sensation and neurology—is suggested, though of course crudely, in such calculations as these. From the historian's point of view the most remarkable fact is the longevity of Helmholtz. Piéron, whose publications, as listed in the *Psychological Register*, so vastly outnumber those of any other writer, receives here but 8 references. That the book really succeeds in avoiding pretty well the rehashing of non-experimentable theories is neatly shown in the fact that the two great masters of the late nineteenth century, Wundt and James, come off with only 7 and 14 references, respectively, and that 7 of the 14 references to James relate to the definitely experimentable problem of the nature of emotion.

In spite of International Congresses, psychology cannot yet be considered genuinely internationalized, and it is interesting to see that 21 of the 23 chapters in this volume in the "International University Series" were written in the United States. (The two exceptions are the chapters on hearing.) The two concluding chapters, however, have a real international tinge; they are on Statistical Method, and it is pleasing to find that the eternal verities admit, as is appropriate, a treatment not too redolent of the accidents of time and place. These chapters are written jointly by Truman L. Kelley (Stanford University) and Eugene Shen (China Institute in America). The question of the nationalism or internationalism of the book, however, may probably be more fairly judged by the Name Index than by the authorship of the chapters. The reviewer, whose provincialism must at once be admitted—or rather emphasized—has compared his own "hundred neediest" as described above, against Murchison's Index, with a view to answering this special question. Slightly over half of the 82 references are to American work. Let us try the obviously fairer method of taking a random sample of 100 authors from Murchison's own Index, together with the number of references. The following figures result: there are in the text 63 American authors, having a total of 85 references, and 37 foreign authors, with a total of 70 references.

Another attempt to gauge the adequacy of the book as a presentation of the *foundations of experimental psychology* might utilize the framework offered in Boring's book mentioned above. It will, of course, be objected that Boring's book traces experimental psychology only to 1910, and mentions more recent developments only incidentally. The fact remains that it is the only history of experimental psychology in existence, and that the foundations of experimental psychology in 1929, though including much that is new, ought not to omit many contributions which were important

enough to find a place in Boring's picture. Confining one's self to work published between 1879 and 1910, one finds (again by the sampling method) that of 100 investigators named by Boring as contributing during this period, 67 appear in Murchison. Considering the obscurity or the very limited contribution of many individuals who receive only one casual mention in Boring, and the further fact that Boring's book is really more comprehensive than its title implies (including a good many non-experimental contributions), the score of 67 must, I think, be regarded as extraordinarily high. Such statistics as these do not, perhaps, tell what the reader would most like to know about Murchison's book, but they are the only means available to the reviewer to put in objective or nearly objective form the evidence that the book really is, with the exceptions above noted, remarkably comprehensive.

Reviews of individual chapters would surely be out of place here. Many of the chapters are written by men who have devoted decades to the problems of which they write; an outsider's evaluation of their work is worth but little. Most of the chapters are very condensed presentations of complex subject matter, and a further condensation here would probably be more exasperating than helpful. If the new editions of the book which Professor Murchison promises us contain equally brilliant chapters upon the experimental problems which have been omitted, the book has a good chance to become a standard reference work without which no experimental psychologist can live.

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GARDNER MURPHY

HARTSHORNE, H., MAY, M. A., & MALLER, J. B. *Studies in the Nature of Character. II. Studies in Service and Self-Control.* New York: Macmillan, 1929. Pp. 559.

This is the second volume of studies in character conducted by the Character Education Inquiry of Teachers College, Columbia University, in cooperation with the Institute of Social and Religious Research. The first volume dealt with studies of deceit. The present one falls into two distinct divisions, the first studying service and the second self-control. It affords an interesting experimental approach to these problems, which have hitherto been considered rather unapproachable. Most previous work in mental measurements has dealt with abilities or capacities rather than with attitudes and personality characteristics. Consequently, studies like the present should receive careful consideration, because they are opening up a wide field for profitable research.

Dealing first with the studies of service, we are confronted with the problem of measuring tendencies of individuals to be of service to other people, even in the face of certain resistance on their own part. The results were obtained by giving the various tests to different groups of school

children and attempting to correlate the tests with other criteria of service. The first test involved a spelling contest with individual and class prizes. Each child could choose whether he wished to help the class win a prize or to compete for an individual prize. In another test he could vote what to do with the money if the class did get the prize—give it all to the boy or girl scoring highest, or give it all to some hospital child or some needy family, with various other alternatives between these extremes. There was a learning test (code substitution) in which they might compete in order to win money which was to be given to charity, or in which they might compete for an individual prize. Then they were presented with a school kit, containing such things as drinking cup, pencil sharpener, ruler, eraser, and had the privilege of making up other kits for poor children by donating some items from those kits which had been given them. Finally, they were allowed to clip pictures from magazines at home and bring them in an envelope to be given subsequently to sick children. These tests were given to children in four different schools.

For a criterion or "reputation," as the authors call it, the teachers rated the individuals, using a little series of "portraits," in which there were given descriptions of different individuals. Some of these individuals were extremely altruistic and others extremely selfish, with intermediate grades, and the portraits had been arranged in a hierarchy and weighted on the basis of the estimates of several judges. The teacher compared her pupils with these portraits and rated them accordingly, much after the manner of scales for judging handwriting or compositions. A similar procedure was arranged for the children to rate each other on a "guess who" test, which used similar portraits. Then there was a check list involving alternative pairs of traits, such as "careful-careless" for the teacher to use. Furthermore there was a conduct record, and also a record of any actual social service that the children had rendered. When these items were weighted they constituted the final criterion for evaluation of the tests.

In a review of this sort space forbids a detailed presentation of the interesting analysis of the data. The authors take this up from every conceivable angle. They check their tests against the general criterion and then study the influence of many other factors. The tests, themselves, are fairly reliable—upwards of .80. The criterion has about the same reliability as nearly as can be estimated. The individual tests yield correlations with the criterion of not over .30, but the weighted total of the tests correlates into the criterion to the extent of .61. The clearer results are seen with the extreme individuals, whereas in the middle range there is no close differentiation. Other factors that show some relation to service tendencies are the friends that a child goes with, the general classroom code or morale, satisfactory school adjustment, the example of parents and general cultural level. There are also some tendencies for communities, national groups, the religious groups to be factors, but they work in specific

fashion rather than to influence service tendencies generally. Sunday School and club members are likewise slightly more cooperative than non-members. However, there is little relation of age, intelligence, sex, emotional condition, resistance to suggestion or sociability, to the service factor in question. Service tendencies appear to be specific to a greater extent than general.

The second part of the volume deals with the measurement of self-control. This is analyzed to involve persistence and inhibition as its two main aspects and tests were devised for each of these. In measuring persistence a story was read to the children up to the climax, and the remainder of the story was presented to them in printed form but with the type so arranged that it was very difficult to read. It might comprise all capitals or capitals and small letters mixed, with sometimes irregular spacing between letters in the middle of a crowd. A child could read this himself if he wished or go on to something else. Then there was a series of puzzle tests, in which one could persist if he wished, while others were available if he wanted to stop the one on which he was engaged.

For inhibition measurements the subjects read a story themselves, the last page of which was pasted down. They were told to write how they thought the story would come out, but they could break open the page if they wanted to. In another test they were called upon to read a story up to the climax and then count the letters on the last page read without breaking open the succeeding pages to see how the story came out. In another instance a small toy bank was placed on the desk to be used later, and they were told not to touch it for the present. Meanwhile they took six other tests, and as the examiner collected each test he noted whether the dial had been moved. A somewhat similar device was used with a "puzzle peg" which had some smaller puzzles scattered through it which they were not to touch until the proper time. Again the subject did arithmetic on a page with pictures, cartoons and interesting remarks interspersed while he was instructed to stick to the arithmetic. In the same way he did arithmetic on a page that had also a "what's wrong with this picture" section at one side. Then there was some candy distributed and they were told not to use it until the end of the hour and the examiners checked during the other tests as to whether any of the candy was gone.

The criterion was obtained in much the same manner as in the preceding study of service by means of check lists, "guess who" portraits and the like, and was handled in similar manner. The persistence tests have a fairly high reliability, about .89, and the inhibition tests about .80. It develops that the inhibition tests correlate a little better with the criterion, about .40, than do the persistence, with a correlation of about .20.

In the case of self-control, it is found that the type of conduct is rather specific instead of general just as in the service experiment. Little relation is found between cultural and economic status but a slight relation with age, intelligence, nervous stability and power to resist suggestion.

There are differences between communities but these are specific, influencing only certain kinds of tests. In the inhibition test, sex seems to be a fairly significant factor, the girls manifesting more inhibition than the boys. Twins and siblings seem somewhat more alike than would two children chosen at random. Age, intelligence, emotional conditions, suggestibility, and home background make very little difference in the inhibition test. The classroom, however, proves to be an appreciable factor, presumably because the techniques are actually classroom tests. The authors feel that the best scheme for training along these lines is to present carefully planned situations in which these service or self-control activities must manifest themselves and gradually increase the complexity and difficulty of the situations until the general principles emerge. This procedure, they feel, is better than purely abstract presentation of the principles involved.

The book affords a very interesting approach to a difficult problem, and the authors have handled it apparently as well as it could be handled under these circumstances. They assume a moderate amount of statistical ability on the part of the reader and have given most of the statistical procedures in detail in their first volume. However, adequate foot-notes in the present case will enable one to follow the discussion without difficulty. They analyze their data most thoroughly, sometimes one almost feels too thoroughly, but when they do come to negative conclusions or conclusions indicating a rather slight relationship, they have adequate basis for making the statement, rather than just their general impression. Their initial insistence on the reliability of their measures and criteria is most commendable. The various tests they have devised are quite ingenious and seem to get at the thing they are trying to reach. If we think this through to the adult level, of course some of these procedures would and some would not be feasible. Adults might frequently be skeptical of some of the proposals put forth in the test technique. However, proper modification could doubtless be made. Many of us are interested in these procedures, not merely to get at problems of children's character education, but to analyze adult personality with a view to such things as vocational adjustment. The present volume is certainly worth the attention of any one interested in these problems of measuring personality.

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JOHNSON, A. [Ed.] *Dictionary of American Biography*. Vols. I-III. (20 vols. in the Series.) New York: Scribner's, 1928 (copyright by American Council of Learned Societies). Pp. xi+660; ix+613; ix+618. \$12.50 per vol.*

The lack of an authoritative dictionary of national biography has been

*This review is published jointly with the *Dictionary of American Biography*, by permission of the publishers.

often deplored by American scholars. Encyclopedias and dictionaries of biography abound, but none are comparable in either scope or scholarship to the British *Dictionary of National Biography* edited by Sir Leslie Stephen and Sir Sidney Lee. It was this need that moved the newly organized American Council of Learned Societies to appoint a committee in 1922 to consider such a project. This committee, consisting of Dr. J. Franklin Jameson, chairman, Professor John Erskine, Professor Thomas W. Page, Professor Frederic L. Paxson, Professor Frederick J. Turner, and Dr. Robert S. Woodward, formulated plans for a comprehensive Dictionary of American Biography, contingent upon the raising of adequate funds. It was estimated that at least half a million dollars would be required to cover the cost of preparing the manuscript. Various plans to defray this initial cost were considered, but were found impracticable.

The committee then laid the whole project before Mr. Adolph S. Ochs, controlling owner and publisher of the *New York Times*. Mr. Ochs at once appreciated its significance and agreed on behalf of the New York Times Company to supply the required five hundred thousand dollars. This volume, therefore, and those that are to follow, owe their existence to his public spirit and generosity. Upon his initiative the New York Times Company entered into an agreement with the Council whereby ten yearly payments were to be made for the preparation of the manuscript of the Dictionary. The direction of the undertaking was vested in a Committee of Management of seven members, four of whom were to be appointed by the Council, two by the New York Times Company, and the seventh, to be editor-in-chief, by the other six. In February, 1926, editorial offices were opened in Washington.

The selection of names for a dictionary of biography offers greater difficulties in the United States than in European countries. The very term American is not free from ambiguities. To restrict the term to persons resident in the original colonies and to citizens of the United States by birth or naturalization, would exclude many individuals of foreign birth who have identified themselves with the country and contributed notably to its history. The Committee of Management decided against any such limitation. Three other restrictions, however, were adopted: first, that no living persons should have biographies in the Dictionary; second, that no persons who had not lived in the territory now known as the United States should be eligible; and third, that no British officers serving in America after the colonies had declared their independence should appear in the Dictionary.

Positive qualifications were less easily defined. In general, only those are included in the following pages who have made some significant contribution to American life in its manifold aspects. The Dictionary cannot find space for average or merely typical figures, however estimable they may be. The observation of Sir Sidney Lee is quite to the point: "Actions,

however beneficent or honourable, which are accomplished or are capable of accomplishment by many thousands of persons are actions of mediocrity, and lack the dimension which justifies the biographer's notice. The fact that a man is a devoted husband and father, an efficient school-master, an exemplary parish priest, gives him in itself no claim to biographic commemoration."

Earlier collections of biographies stressed, naturally enough, the lives of soldiers, statesmen, and clergymen whose conspicuousness, aside from their services, made them objects of interest. Physical science, however, has increased immeasurably the importance of the engineer, the technician, and the chemist in modern warfare; the new social sciences have bred ministering and administrative agents who now share the cure of souls; and even politicians now recognize the important rôle of the statistician and the economist in law-making. The modern age with its greater complexity and dependence upon new arts and sciences has brought into view less spectacular, and possibly less heroic, but certainly not less significant, figures. Within a half-century, industry, science, the fine arts, and literature have produced men and women whose special significance is not indicated by such traditional designations as merchant, naturalist, artist and author. The currents of American life and expression have both widened and deepened.

A tentative list of names was first compiled from earlier works of reference, but it was deficient in the particulars just noted. A classification was then devised on the basis of occupations, trades, and professions, as likely under American conditions to bring to light significant figures in specialized fields of human endeavor. For each of these groups some authority was asked to supply a tentative list. Every such list was submitted to other specialists, or to groups of specialists, who dropped some names, added others, and attempted to make a rating of all. To avoid the possibility of names slipping through the meshes of this dragnet, necrologies of all sorts were carefully searched; and the proposed list of names in the first volume was printed and circulated three months before the volume was sent to the printers, in order to discover serious omissions.

Every effort has been made to secure fresh independent accounts of even well-known national figures and not mere compilations of preceding sketches. Contributors have been instructed to base their articles wherever possible upon original sources of information and to list their chief authorities in carefully considered bibliographies. They have been urged also not only to state but to appraise the circumstances and influences which shaped careers. So far as space and material permit, they have stressed such matters as ancestry, parentage, childhood experiences, educational advantages, physical and social environment. In the present chaotic condition of vital statistics in the United States, reliable information about the parentage and ancestry of lesser personages is often wanting; but wherever possible

the names of parents and of husband, or wife, are given in each article. To insure accuracy in such details, a staff has been maintained at the Library of Congress, contributors and editors alike have been under constant obligation for counsel and unremitting service. The American Antiquarian Society of Worcester, Massachusetts, through its Librarian, Mr. Clarence S. Brigham, has placed the resources of its library and its staff freely at the disposal of contributors to the Dictionary. Acknowledgment should be made, also, of the cooperation of many local historical societies and libraries, which have not only furnished detailed information at the cost of much time and effort, but have also directed contributors to unpublished manuscript sources. The Dictionary owes much to the generous interest of the publishers, who have desired to make it in form as well as substance a notable contribution to American scholarship and letters.

Finally, contributors have been urged not to rest content with a bare narrative of events, but so far as possible to leave the reader with a definite impression of the personality and achievements of the subject of each biographical sketch. At every point, however, limitations of space have necessitated terse, compact, direct statement, without rhetorical ornament. The length of an article has not been determined solely by the relative importance of the man, but also by the amount of available authentic material, by the nature of his career, and by the completeness of biographies already published. Quite apart from its usefulness as a general work of reference, the Dictionary should throw light upon the careers of men and women who, by the caprice of fortune, have been lost from view. A scarcely less important function is the re-interpretation of character and career made necessary by new sources of information and new points of view. So far as knowledge permits the Dictionary has endeavored to re-create and re-interpret the lives of the makers of American life and culture.

ALLEN JOHNSON

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THE RELATIVE VALUE OF VOCABULARY AND SENTENCE PRACTICE FOR LANGUAGE LEARNING*

From the Psychological Laboratory of the University of Washington

STEVENSON SMITH AND FRANCIS F. POWERS

How should we go about learning to translate a foreign language? Should we commit to memory a vocabulary of discrete words or should we form sentence habits? Under the conditions of the experiment which is here reported, the results indicate that discrete vocabulary learning is the more effective method.

There is an opinion current among language teachers that it is better for the student to commit to memory foreign words in serial form, that is, in the form of sentences, than to commit to memory the old fashioned vocabulary lists. The examination of recent foreign language texts would seem to show that this opinion is growing.

If the learning of a discrete vocabulary can be shown to be as effective as the learning of prose in creating the ability to make literal translations, then vocabulary lists are, as practice material, to be preferred to prose except where idioms are encountered.

When the vocabulary method is employed words may be listed according to the frequency of their use, and more practice may be given to those words which occur more frequently. If, to be learned properly, words must be learned in all their possible combinations, the task of language learning would be enormous and the amount of practice given to each word could not be made proportional to the importance of this word.

In many special cases the relative value of various methods of learning has been attacked experimentally. For example, the comparative efficiency, for the purpose of rapid reading, of silent and oral methods of reading has been determined. The laboratory and teacher-demonstration techniques of teaching have been subjected to objective measurement to determine the superiority of one over the other. There is, however, very little well controlled experimentation upon any method of language learning.

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Before 1915 a group of studies appeared upon the successive increases in vocabulary from month to month and year to year. These paid small regard to the method employed in learning or the possibility that some other method than the one employed might give better results. Such recent work upon language, as that of Piaget, has not done a great deal to clarify the situation with regard to the best method of language acquisition.

Grinstead (2) tested himself upon the learning of German by the context and list methods. The context method in this case consisted of reading for meaning and looking up unknown words in a dictionary as they were encountered. The list method consisted in listing unknown words and looking them up later. Grinstead says of the experiment: "The factor really tested was the associational influence of the context in fixing the meaning of the new words encountered." Results showed a "3 per cent advantage" in favor of the context method. "That is, according to these results, 3 per cent more of the total number of new words encountered will be recognized when next seen, if the new words were encountered in context, than would be the case if they were listed and looked up." It would seem in an experiment of this sort that a gain of but 3%, with a number of uncontrolled variables operative, is not wholly conclusive.

Henmon (4) describes an interesting experiment conducted in the Madison High School upon the value of word study. The exact method of presenting the words was not described, but it appears to have been one variation of the use of the list or discrete-word vocabulary. Three hundred and fifty sophomores were paired, mainly on the basis of freshman grades. One group was given word study as such, the other group studying words only as encountered in ordinary work in English. At the end of the semester both groups were given: (a) Terman Vocabulary Test (100 words), (b) Thorndike Visual Vocabulary, (c) Trabue Completion Scale L, (d) Tests 1a, 1b of the Thorndike Intelligence Examination, and (e) a special list of 25 words. The results indicate a decided advantage for the study of formal word lists. Differences in most cases were four times the *P.E.* of the difference.

Libby (6) states that "The special purpose of the study (his own) was to discover the relative value of making the word and the short sentence the unit in modern language instruction for various types of learners." Italian was the language used. There were 10

subjects. In addition to tests, introspective reports were taken. General results gave the balance of superiority to the short sentence method. Eight of the 10 subjects gained more by this method. The two who profited most by the vocabulary method were judged the weakest students. Introspective reports indicated that in order to learn detached words the subjects formed sentences of them. To the extent to which this occurred, the proposed difference between methods was lost, all learning being by the sentence method.

McKee (7, 8, 9) has studied the teaching of spelling by column and context forms. His general conclusions are quoted:

"1. As determined in this investigation, pupils who studied and were tested by the column form seemed to have acquired a greater amount of spelling ability than did the pupils who studied and were tested by the phrase form.

"2. The pupils of the Column Group procured better scores than the Phrase Group when tested in their ability to spell words previously studied.

"3. The two groups seemed possessed of approximately equal ability to spell words previously studied when the words were used in a new phrase form."

Shuh Pan (10) has tested the general influence of environmental context upon recall. He concludes that recall of any material is favored by the presence of an environmental factor which has some associative connection with the material. A word context logically related to the response word exerted a beneficial effect upon learning. The variation of such a context during learning, however, lessened learning. These results indicate that context associations facilitate vocabulary learning if the context remains the same, but when the context is varied, as in ordinary conversation, the efficiency of learning is lessened. This general principle applies to all vocabulary learning wherein the word appears in context.

Hawley (3) in 1922 studied the list *vs.* sentence method of teaching spelling in 10 schools in Rochester, New York. The test covered 30 lessons in the regular text. Initial tests were given to determine ability. Hawley says of the work, "The chief conclusion to be drawn . . . is that there is no advantage in having children write their spelling words in sentences. . . . It is evident that if teachers are to have words written into sentences they must see values in that procedure other than spelling values."

Hunkins (5) confesses that "it was hoped that the theory that

children spell better when given a list of words than when confronted with the normal writing situation might be verified." His conclusions seem to bear out his expectation. He found that children spell more poorly in 'sentence dictation than in word dictation.

In summing up the foregoing evidence, it may be said that the results of experiment are somewhat ambiguous and contradictory. Most of the more recent and best-controlled experiments, however, seem to indicate some advantage for detached word learning over sentence or multiple word learning.

The experiment herein reported was designed to test the relative effectiveness of the learning of separate symbols with their English word equivalents, and the learning of these symbols in sentence form with their English sentence equivalents. What corresponded to foreign words were in this case the symbols of the English alphabet. These were chosen rather than actual foreign words, and rather than nonsense syllables, for several reasons.

Almost any foreign language words are likely to be known to certain of the subjects. Because of their varying length, it is difficult to select a list of foreign words and their English equivalents all of which offer equal ease of learning. The disadvantages of employing nonsense syllables are that it is impossible so to devise them that they carry no associated meaning, and that they are likely to be wrongly perceived as sounds when spoken by the experimenter owing to the subject's unfamiliarity with them. The symbols of the English alphabet were employed to overcome these objections and because of certain advantages that their use entails. The first of these advantages is that the subject requires no practice in perceiving these symbols prior to their use in the experiment. Properly selected, they are unambiguous and are not confused with each other. Though, unlike the nonsense syllable, letters of the alphabet are not supposed to be devoid of significance, they are so general as associative cues as to discourage somewhat the use by the students of the mnemonic method. The speed at which stimulus word and response word were given and repeated was such as further to discourage the borrowing of some previous meaning from the symbols.

Two separate vocabularies, each consisting of nine letters and nine corresponding English words, were arranged. A vocabulary consisted of three subject nouns, three verbs, and three object nouns. All of the words were monosyllabic. Care was taken that the alpha-

TABLE 1

Vocabulary B		Vocabulary A	
Subject		Subject	
R	ducks	L	boys
Y	geese	F	men
C	hens	N	girls
Verb		Verb	
S	have	J	want
P	like	G	find
T	seek	B	keep
Object		Object	
X	fun	K	homes
Q	nests	H	fires
M	bread	V	books

betical symbols did not directly suggest the words which they were to represent. The two vocabularies are presented in Table 1.

Each of the two vocabularies was arranged in two forms for presentation. One form of each vocabulary consisted of the individual symbols each followed by its English equivalent. The second form of each vocabulary consisted in sets of three symbols corresponding to noun, verb, and object followed by their noun, verb, and object English equivalents in sentence form.

The separate combinations of three subjects, three verbs, and three objects are 27 in number. As shown later, 18 of these combinations were used for practice and 9 were used as a final test series to measure the amount of the subjects' learning.

A single rehearsal of the 18 practice sentences with English equivalents involves the repetition of each symbol and each word six times. An equal amount of practice on the discrete words and their symbols was obtained by going through the discrete word list six times for each time through the sentence list. After one rehearsal of the sentence list, or after six rehearsals of the discrete word list, there was an interval of one minute. This was found necessary for the avoidance of excessive fatigue on the part of the subjects. Thus the sentence list was rehearsed five times by each subject and an exactly equal amount of practice was had on the word list, the latter being rehearsed 30 times.

After the word practice, and after the sentence practice, the subjects took pencils and blanks provided for the purpose and the experimenter read the test list composed of nine "sentences," each con-

taining three unfamiliar combinations. These, as in the practice series, were spoken at three-fifths-of-a-second intervals. Ten seconds elapsed between the beginning of successive presentations, during which time the subjects attempted to write down the English equivalent of the three symbols.

The same test series was used whether the practice had been on discrete words or on sentences. Subjects who learned Vocabulary A as discrete words learned Vocabulary B as sentences. Those who learned Vocabulary B as discrete words learned Vocabulary A as sentences.

There were, then, four sets of materials: Vocabulary A in discrete words and in sentence form, and Vocabulary B in discrete word form and in sentence form. Each subject was given two forms of material for practice and was tested for his retention of each immediately after practice. The giving of the two forms was separated by an interval of one week, the practice occurring at corresponding hours. The order of combination of the two sets of material practiced by each group of subjects was such as to compensate for any effect from the order of priority of the two vocabularies and from the order of priority of word and sentence learning. This arrangement is indicated in Table 2.

In order further to control two variables, namely, order of presentation and relative difficulty of the two vocabularies, an empirical correction for these factors was determined. Vocabulary A was found to be 1.07 times as difficult as Vocabulary B, and the practice effect of the first week was found to be .87 that of the second week. For final computation, the raw data were corrected by means of these two coefficients. This was necessary in calculating the corre-

TABLE 2

Subjects	Form 4 Vocab. A words	Form 2 Vocab. A sentences	Form 3 Vocab. B words	Form 1 Vocab. B sentences
Group 1				
Subgroups A and E	2nd week			1st week
Group 2				
Subgroups D and H	1st week			2nd week
Group 3				
Subgroups B and C		1st week	2nd week	
Group 4				
Subgroups F and G		2nd week	1st week	

lation between the discrete word learning and the sentence learning of all the subjects.

There were 176 subjects in the experiment. These were students in an introductory course in psychology. There were approximately equal numbers of men and women. The experiment was conducted on eight separate subgroups that averaged 22 subjects each (Table 2).

The material was presented to the subjects orally. Visual presentation was avoided in order to discourage the subjects' rehearsing the material in an irregular way.

MATERIALS FOR THE EXPERIMENT

Directions for Giving Practice Series, Forms 1 and 2. (Vocabulary B sentence practice and Vocabulary A sentence practice.)

"Today the experiment consists in finding out how people learn a new language. Your grade in the course will not be affected by the amount you learn. Do your best, however, in order that the experiment may be a success. Certain letters of the alphabet will stand for certain words. We shall rehearse over and over again various combinations of letters and the sentences for which they stand. For example, I might say D-E-A-cats-climb-trees, keeping time with this metronome (100 per minute). Now let's practice this together. First I shall say the letters and words, and then, without any pause, you will say them. (Experimenter and subjects do this five times.) That's good. The words that we are going to use are all one-syllable words. (Read and spell the entire vocabulary that is to be used, e.g., "ducks, d-u-c-k-s", etc.) Be as careful as you can and try to keep perfect time with the metronome."

(Practice series 1 or 2 is now given 5 times. One minute interval between series and before test series. Jazz phonograph music played during interval.)

Practice Series, Form 1

R S Q	Ducks have nests
Y P M	Geese like bread
C T X	Hens seek fun
R P Q	Ducks like nests
Y T M	Geese seek bread
C S X	Hens have fun
R T Q	Ducks seek nests
Y S M	Geese have bread
C P X	Hens like fun
R S M	Ducks have bread
Y P X	Geese like fun
C T Q	Hens seek nests
R P M	Ducks like bread
Y T X	Geese seek fun
C S Q	Hens have nests
R T M	Ducks seek bread
Y S X	Geese have fun
C P Q	Hens like nests

Practice Series, Form 2

L J H	Boys want fires
F G V	Men find books
N B K	Girls keep homes
L G H	Boys find fires
F B V	Men keep books
N J K	Girls want homes
L B H	Boys keep fires
F J V	Men want books
N G K	Girls find homes
L J V	Boys want books
F G K	Men find homes
N B H	Girls keep fires
L G V	Boys find books
F B K	Men keep homes
N J H	Girls want fires
L B V	Boys keep books
F J K	Men want homes
N G H	Girls find fires

Directions for Giving Practice Series Forms 3 and 4. (Vocabulary B word practice and Vocabulary A word practice.)

"Today the experiment consists in finding out how people learn a new language. Your grade in the course will not be affected by the amount you learn. Do your best, however, in order that the experiment may be a success. Certain letters of the alphabet will stand for certain words. We shall rehearse over and over again the letters and the words for which they stand. For example, I might say Z-hat, and then you would say Z-hat, keeping time with this metronome (100 per minute). Now let's practice this together. First I shall say the letter and word, and then, without any pause, you will say them. (Experimenter and subjects do this five times.) That's good. The words that we are going to use are all one syllable words. (Read and spell the entire vocabulary that is to be used, e.g., "ducks, d-u-c-k-s", etc.) Be as careful as you can and try to keep perfect time with the metronome."

(Practice series 3 or 4 is now given 5 times. One minute interval between series and before test series. Jazz phonograph music played during interval.)

Practice Series, Form 3

R	Ducks	R	Ducks
Y	Geese	Y	Geese
C	Hens	C	Hens
S	Have	S	Have
P	Like	P	Like
T	Seek	T	Seek
X	Fun	X	Fun
Q	Nests	Q	Nests
M	Bread	M	Bread
R	Ducks	R	Ducks
Y	Geese	Y	Geese
C	Hens	C	Hens
S	Have	S	Have
P	Like	P	Like
T	Seek	T	Seek
X	Fun	X	Fun
Q	Nests	Q	Nests
M	Bread	M	Bread
R	Ducks	R	Ducks
Y	Geese	Y	Geese
C	Hens	C	Hens
S	Have	S	Have
P	Like	P	Like
T	Seek	T	Seek
X	Fun	X	Fun
Q	Nests	Q	Nests
M	Bread	M	Bread

Practice Series, Form 4

L	Boys	L	Boys
F	Men	F	Men
N	Girls	N	Girls
J	Want	J	Want
G	Find	G	Find
B	Keep	B	Keep
K	Homes	K	Homes
H	Fires	H	Fires
V	Books	V	Books
L	Boys	L	Boys
F	Men	F	Men
N	Girls	N	Girls
J	Want	J	Want
G	Find	G	Find
B	Keep	B	Keep
K	Homes	K	Homes
H	Fires	H	Fires
V	Books	V	Books
L	Boys	L	Boys
F	Men	F	Men
N	Girls	N	Girls
J	Want	J	Want
G	Find	G	Find
B	Keep	B	Keep
K	Homes	K	Homes
H	Fires	H	Fires
V	Books	V	Books

Directions for Giving Test Series, Forms 1, 2, 3, and 4. Immediately after practice is finished distribute tests blanks of the following form:

- | | | | |
|----|-------|-------|-------|
| 1. | _____ | _____ | _____ |
| 2. | _____ | _____ | _____ |
| 3. | _____ | _____ | _____ |
| 4. | _____ | _____ | _____ |
| 5. | _____ | _____ | _____ |
| 6. | _____ | _____ | _____ |
| 7. | _____ | _____ | _____ |
| 8. | _____ | _____ | _____ |
| 9. | _____ | _____ | _____ |

The experimenter says:

"I am about to read you certain letter combinations that stand for sentences. Do not write down the letters I say but only the words that these letters mean. This is very important. Be careful not to write down the letters I say. To do so would spoil the experiment. You may find that you do not know what these letters mean. If this is the case just write down whatever comes to your mind. What you write in this way is very likely to be correct. The blanks are numbered 1-2-3-4 down to 9" (10-second intervals between the beginning of stimulus letters).

Test Series, Forms 1 and 3

1. R S X
2. Y P Q
3. C T M
4. R P X
5. Y T Q
6. C S M
7. R T X
8. Y S Q
9. C P M

Test Series, Forms 2 and 4

1. L J K
2. F G H
3. N B V
4. L G K
5. F B H
6. N J V
7. L B K
8. F J H
9. N G V

Collect papers immediately.

Bundle these together and mark according to section, day, hour, and week.

RESULTS

It will be remembered that each subject learned one vocabulary by the discrete word method and another vocabulary by the sentence method. The order in which the two forms of learning occurred and the order in which the two vocabularies occurred was compensated by the procedure that is indicated in Table 2. Correction was further made for difficulty of vocabulary and for first and second week practice effects. Thus the variable to be measured is well isolated.

Table 3 indicates the relative practice value of the two methods of presentation, discrete word and sentence, in terms of the number of single words translated and the number of complete sentences translated.

The effect of discrete word practice is here shown to be much

TABLE 3

	By discrete word learning	By sentence learning	<i>r</i>	Difference	<i>Diff.</i> $\sigma_{diff.}$	Reliability of difference (<i>P</i>)	Number of subjects
Mean (and sigma) of <i>words</i> correct in test series	17.64 (.44)	13.76 (.57)	.25	3.88	5.7	.999	176
Mean (and sigma) of <i>sentences</i> correct in test series	3.6 (.21)	2.3 (.23)	.19	1.3	4.4	.999	176

greater than that of sentence practice. The value of vocabulary list learning was 28% greater than the value of sentence learning where the measure of learning is the number of words successfully translated from sentence dictation. This value rises to 57% where the measure of learning is the number of whole sentences successfully translated from sentence dictation.

If a hypothetical explanation is demanded of the fact that vocabulary practice was found to be more profitable than sentence practice, two principles may be considered.

The first of these is that the longer the interval between substituted stimulus and conditioned response, the greater is the amount of practice necessary for a given degree of conditioning. In the practice of our three-word sentences two terms separated each symbol from its corresponding word, whereas in vocabulary practice each symbol was followed immediately by its corresponding word. Thus the time interval between substituted stimulus and conditioned response was shorter in the vocabulary practice.

The second principle is that when a number of diverse responses follow the substituted stimulus, inhibitory conditioning results. In our sentence practice each symbol was immediately followed by any one of three other symbols or (in the case of the object symbols) by any one of three words. In the vocabulary practice each symbol was immediately followed by only one word.

The foregoing results tend only to indicate the superiority of the discrete word learning method over the sentence learning method for purpose of translating such a "foreign language" as is comprised

by our symbols when this language is presented orally. When a language is presented visually for the purpose of learning, or when the amount of practice is different, or when such a language differs in kind or in complexity from that used in this experiment, or when the language is idiomatic, or when the ability to converse rather than to translate is sought, then the relative value of word and sentence learning might not be properly predicted from the results of this experiment.

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LA VALEUR RELATIVE DES EXERCICES DE VOCABULAIRE ET DE PHRASES DANS L'APPRENTISSAGE D'UNE LANGUE

(Résumé)

Cent soixante-seize sujets ont employé chacune de deux méthodes pour apprendre des symboles et des mots correspondants. Une méthode a employé la suite immédiate du symbole et de la signification, comme dans les listes des vocabulaires, et l'autre méthode a employé les symboles en groupes de trois en forme de phrase suivis par les phrases correspondantes de trois mots. Il y a eu deux vocabulaire séparés, chacun de neuf mots. Les sujets ont pratiqué un vocabulaire en forme de phrases et l'autre en forme de mots séparés. Ils ont répété chaque mot, ou en forme de phrase ou en forme de mots séparés, trente fois. L'ordre des deux formes de l'appren-

tissage et l'ordre des deux vocabulaires ont été compensés en divisant les sujets en quatre groupes et en variant ces ordres convenablement. On a fait aussi une correction empirique pour la difficulté relative du vocabulaire et pour les erreurs de pratique. On a testé la quantité de l'apprentissage par la traduction rapide des symboles en forme de phrases. Ces phrases de test ont été des combinaisons non pratiquées auparavant. La valeur de la pratique des mots séparés a été plus grande de 28% que celle de la pratique des phrases, mesurée par le nombre de mots traduits dans la série de test, et plus grande de 57%, mesurée par le nombre de phrases complètes traduites dans la série de test. La constance moyenne de ces différences (P) a été de 0,66.

SMITH ET POWERS

DER RELATIVE WERT DER WORTSCHATZ- UND SATZKON- STRUKTIONSÜBUNGEN IM SPRACHUNTERRICHT

(Referat)

176 Versuchspersonen lernten Symbole und entsprechende Wörter nach zwei verschiedenen Methoden. Nach der einen Methode lernte man die einzelnen Symbole unmittelbar mit ihrer Bedeutung, wie in einem Vokabularium, nach der andern Methode drei Symbole in einen Satz vereinigt mit dem aus drei Wörtern bestehenden Satz. Man hatte zwei getrennte Vokabularien, jedes mit je neun Wörtern. Die Versuchspersonen übten eines der Vokabularien in Satzform und das andere in Wortform. Jedes Wort, ob im Satz oder isoliert, wurde dreimal wiederholt. Die Reihenfolge der beiden Lernarten und Vokabularien wurde kompensiert, indem man die Versuchspersonen in vier Gruppen teilte und die Ordnung entsprechend variierte. Es wurden ferner empirische Korrekturen hinsichtlich der relativen Schwierigkeit und der Übungsfehler vorgenommen. Dass Erlernte wurde mittels schneller Übersetzung der Symbole in Satzform geprüft. Diese Prüfungssätze bestanden aus Kombinationen, die vorher nicht geübt wurden. Dass Ergebnis der Einzelwortübung war um 28% grösser als das der Satzübung, wenn man es nach den in den Testserien übersetzten Wörtern bemisst, aber um 57% grösser, wenn man es nach der Anzahl der in den Testserien übersetzten ganzen Sätzen bemisst. Das Mittel der Zuverlässigkeit dieser Differenzen (P) war 0.66.

SMITH UND POWERS

A STUDY OF THE MINNESOTA RATING SCALE FOR MEASURING INFERIORITY ATTITUDES*¹

From the Department of Psychology of the University of Minnesota

HANNA F. FATERSON

Ever since the concept of the inferiority attitude was introduced into the psychological literature by Adler (1, 2), it has been widely used and discussed as an explanatory principle of human behavior, but not until recently has any attempt been made to study it quantitatively under other than clinical conditions. The first study of this sort, made at the University of Minnesota (11), resulted in a self-rating scale, now included in the Minnesota College Entrance Examination, as an attempt to measure the degree to which an individual is characterized by the inferiority attitude, as that term is commonly understood.

The rating scale used in the original study consisted of 137 traits usually considered characteristic of the inferiority attitude. The ratings were made on a five-point scale: --, -, 0, +, ++. A check in the ++ column was used to indicate the presence of the trait to a marked degree; in the + column, its presence to a slight degree; in the - column the presence of its opposite to a slight degree; and in the -- column, the presence of its opposite to a marked degree. A check in the 0 column indicated that the person rated was characterized neither by the trait nor by its opposite.

Students in introductory courses in psychology at the University of Minnesota were used as subjects in Miss Heidbreder's study. The group numbered 268, 120 men and 148 women. Each subject received three copies of the scale, on one of which he was asked to rate himself, and on the other two to secure ratings of persons who

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¹This article represents part of a more extensive study, the complete report of which is on file in the University of Minnesota Library. The author wishes to express her deep appreciation to Dr. Edna Heidbreder under whose direction the study was conducted, and who has carefully scrutinized the present manuscript. Thanks are also due to Professor D. G. Paterson for many valuable suggestions.

knew him well. The papers were scored by giving single pluses and minuses the weight of one, double pluses and minuses the weight of two; items considered diagnostic of the I.A. were given positive scores; those and their opposites, negative scores. The final score was the algebraic sum of the positive and negative scores. The results, based on 360 ratings for men and 444 for women were then subjected to a statistical analysis. The results of this analysis may be summarized as follows:

1) The scale forms a consistent set of traits, which, taken together, correspond to the general concept of the Inferiority Attitude as it is generally described in the literature. "The groups of traits which are theoretically most significant are, on the whole, those which are empirically most characteristic of the group representing the I.A." This fact was determined by analyzing the list item by item to see whether each trait distinguishes between the upper and lower quartiles of the distribution.

2) When tried out on a large group of "normal" college students, the scale gives a normal distribution with a wide variability, and is capable of revealing individual differences in the ability studied. Since the scale represents a consistent set of traits and gives a reliability coefficient of $.73 \pm .03$ on retest after a six-weeks' interval, we can suppose that the scores represent true individual differences in this respect, rather than chance distributions of numbers.

On the basis of this preliminary analysis the scale was revised. Only the most diagnostic 94 of the original 137 traits were included. In scoring the revised scale, the items are weighted according to their diagnostic value. It is this revised scale that has been used in the present study.²

In its consistency and ability to give a normal distribution the scale fulfills two of the requirements of a good test. But, in the author's words, "only in a rather roundabout sense can the scale be called a measure of the inferiority complex. . . . Only as the scale goes back to the accepted definition, and only as this goes back to clinical experience, can there be said to be a correspondence between the scale and the thing it tries to measure. The testing of the scale itself, i.e., the attempt to determine the diagnostic value of its items trait by trait, shows primarily that it is self-consistent; and secondarily and by inference, since the scale was constructed along the lines

²The data on which this revision is based are so far unpublished.

of the inferiority complex as described in the literature, this self-consistency means that the predicted pattern is found in the observed condition" (11, p. 255). The question remains: What does the scale measure in terms other than itself?

The present investigation, chiefly exploratory in character, is an attempt to throw some light on this question by analyzing the relation of the scale to some other personal data collected on a group of university freshmen. The data used are the following: scores on three other tests of emotional attitudes, the results of physical examinations,³ an analysis of interests, social economic status, a college ability test, and academic achievement in college. The problem, therefore, is *not* a question of the general investigation of feelings of inferiority, but rather a study of this particular scale in relation to some of the data collected by the University on entering freshmen.

I. GENERAL NORMS

The rating scale, headed "Personal Traits Rating Scale," is included in the same folder with the College Ability Test given to all entering students at the University of Minnesota. For this reason it was possible to obtain data on large and unselected groups of college students. The freshmen registered in the College of Science, Literature, and the Arts (referred to as the S.L.A. Group) in September, 1926, were chosen for the main experimental group.⁴ This group consisted of 1424 students, 815 men and 609 women. Some additional groups of students used were the following:

- 1) S.L.A. students entering the University in September, 1927, numbering 745 men and 649 women.
- 2) Freshmen engineers entering in 1926, numbering 235.
- 3) Students registered in the course in Elementary Experimental Psychology in the year 1926-1927. There were in this group 62 men and 112 women, mostly sophomores.

The average score and the measures of variability for the main experimental group are given below:

³The study of the relation of the scale to physical examination results will be published separately.

⁴The writer is indebted to Professor D. G. Paterson for permission to use the data on entering freshmen.

Number of cases	1424
Average I.A. score	+39.2±.7
Range	+153 to -75
Standard deviation	40.2
Coefficient of variability (using <i>S.D.</i>)	30%

Explanatory note: With the present system of scoring, the positive scores indicate the presence of the inferiority attitude as here defined, the negative signs indicate its absence. According to the scale, the average of the group, or the "normal" condition for college freshmen, falls on the positive side. The upper quartile falls at +63, the lower at +3. The 90th percentile falls at +89. Therefore scores above this point indicate the presence of the I.A. as here defined to a high degree.

The wide range of variability shows that the capacity of the scale to reveal individual differences persists in spite of the constant errors to which rating scales in general, and self-rating scales in particular, are subject. The coefficient of reliability of .73 obtained on retest after a six-weeks' interval, which compares favorably with figures reported in the literature for similar types of material, suggests that this variability is really a function of individual differences in "whatever the scale measures."

Let us now examine more closely the results on various university groups, classified by sex and professional choice. These results are given in Tables 1 and 2. When the scores of the S.L.A. students are examined, we see that both the average I.A. scores and the *S.D.*'s remain stable from year to year for each sex. The differences are so slight as to justify combining the data for the two years in comparing professional groups.

Sex differences appear to a very slight degree only. Consistently, the women's scores are slightly higher than those of the men. In fact, when the groups for the two years are combined, the difference becomes statistically significant (i.e., the reliability of the difference is larger than 4), due to the small probable error. However, the same norms are certainly applicable to both sexes. The variability, on the other hand, is slightly greater for men than for women. But both of these differences are so slight that, while they need to be kept in mind in interpreting some general results, they can be of no importance in interpreting individual scores.

Some interesting differences appear between the various professional groups. The students registered in the School of Business, men registered in Engineering, women in Nursing and in Home Economics all have slightly lower scores than the S.L.A. group;

TABLE 1

AVERAGES AND STANDARD DEVIATIONS OF INFERIORITY ATTITUDE SCORES FOR
FRESHMEN REGISTERED IN THE COLLEGE OF SCIENCE
LITERATURE, AND THE ARTS

	Men				Women			
	No.	Av.	S.D.	P.E. _{av.}	No.	Av.	S.D.	P.E. _{av.}
Entering in 1926	815	32.7	43.3	1.02	609	37.6	39.8	1.09
Entering in 1927	743	33.3	43.0	1.06	649	38.7	41.2	1.09
1926-1927 combined	1558	32.9	43.1	.74	1258	38.2	40.8	.78

Reliability of Sex Differences

	Difference	P.E. diff.	$\frac{\text{Diff.}}{\text{P.E. diff.}}$
Entering in 1926	4.9	1.49	3.7
Entering in 1927	5.4	1.52	3.6
1926-1927 combined	5.3	1.07	4.9

that is, according to the measure used, they are less liable to possess feelings of inferiority. Men registered in the Colleges of Education and of Dentistry, and women in the School of Music and in Medicine have higher than average scores. Only two of these groups, however—men who are engineers and women who are musicians—show differences that are significant statistically, an interesting fact in view of the current campus opinion that engineers are “tough-minded” and musicians “temperamental.” The differences between the *extreme* groups in each sex are about one-half of a standard deviation (about 20 points in raw score). This indicates that, although in general individual differences are much more significant than group differences, there is evidence in the case of some professional groups that they attract individuals with a characteristic temperamental makeup. It is to be noted, of course, that most of these *extreme* groups are based on a relatively small number of cases. Some of these tendencies, however, are corroborated by the results obtained in the analysis of interests (see Section III below), for example the low scores of engineers and of the business group, and the high average scores in the School of Music.

II. THE INFERIORITY ATTITUDE AND OTHER TESTS OF EMOTIONAL ATTITUDES

The origin and general nature of the rating scale suggests that it is a measure of some sort of emotional attitude. But this point needs empirical confirmation; the scale needs to be checked against some other measures of this phase of personality. Since our problem was chiefly one of general orientation, it seemed advisable to use some tests which could be easily applied to large numbers of cases, to see if any general tendencies or trends of this sort could be discovered. The tests used were the Woodworth Personal Data Sheet, the Minnesota scales of introversion-extroversion and of worries, and a measure of overreaction derived from the inferiority attitude scale itself.

The Woodworth Personal Data Sheet is probably the best known

TABLE 2
AVERAGES AND STANDARD DEVIATIONS OF INFERIORITY ATTITUDE SCORES FOR FRESHMEN (1926 AND 1927) CLASSIFIED BY COLLEGES OR DEPARTMENTS

<i>Men</i>							
College or Department	No.	Av.	S.D.	P.E. <i>av.</i>	Diff.	Comparison with S.L.A.* men Diff.	
						P.E. <i>diff.</i>	P.E. <i>diff.</i>
Education	60	43.8	43.2	3.8	+10.9	3.9	2.8
Dentistry	84	41.6	40.8	2.9	+ 8.7	3.0	2.9
Medicine	230	34.8	42.4	1.9	+ 1.9	2.0	.9
Law	201	34.7	43.2	2.1	+ 1.8	2.2	.8
Pharmacy	33	34.4	44.9	5.3	+ 1.5	5.4	.3
Agriculture	137	34.2	38.9	2.2	+ 1.3	2.3	.6
Business	490	29.2	42.9	1.3	— 3.7	1.5	2.5
Engineering	235	22.4	43.3	1.9	—10.5	2.1	5.8
<i>Women</i>							
College or Department	No.	Av.	S.D.	P.E. <i>av.</i>	Diff.	Comparison with S.L.A.* women Diff.	
						P.E. <i>diff.</i>	P.E. <i>diff.</i>
School of Music	81	49.4	35.8	2.7	+11.2	2.8	4.0
Medicine	33	49.2	43.9	5.2	+11.0	5.3	2.1
Education	410	39.5	42.7	1.4	+ 1.3	1.6	.8
Business	107	34.6	39.4	2.6	— 3.6	2.7	1.3
Home Economics	150	33.3	36.9	2.0	— 4.9	2.1	2.3
Nursing	47	32.6	40.8	4.0	— 5.6	4.1	1.4

*College of Science, Literature, and the Arts.

and the best standardized test of the kind desired.⁵ Its validity as a measure of neurotic tendencies is indicated by the fact that the average scores of psychoneurotic soldiers proved to be about 25 points higher than that of "normal" individuals (13). The recent work of House (14) shows that the results of the questionnaire, when applied to college students, are in close agreement with the results of a psychiatric interview. The reliability of the questionnaire is reported in the literature to be about .90 (8). The Woodworth questionnaire, then, is generally agreed to be a measure of the psychoneurotic disposition, and a fairly accurate measure.⁶ It has been used in this study as a criterion of general emotionality or emotional stability. Using this criterion, we may ask the question: How is the I.A. scale related to general emotional stability?

The worries scale devised by Miss Heidebreder consists of 60 items most of which are similar in content to those of the I.A. scale. The chief difference between the two scales lies in the way in which the questions are asked. In the I.A. scale the "traits" are stated as facts, and the individuals are asked to estimate the degree to which they possess a given trait; in the worries scale, the presence of a given state of affairs is assumed, and the subjects are simply asked whether or not they have a tendency to worry about it. Thus, for example, in the I.A. scale they are asked whether, and to what extent, they are sensitive to praise and blame; in the worries scale, they are asked whether they worry about the opinion others have of them. Or, to take another example, it is perfectly possible to have poor physical health, and yet not worry about "not having enough physical strength to accomplish what one most wishes to accomplish."

The worries scale is scored by assigning the double pluses checked (considerable worry or concern) the value of plus 2; the single pluses (slightly troubled by the item at times) the value of plus 1; zeroes (no tendency to worry about the item) are disregarded in the scoring. The odd-even reliability coefficient of the scale is $+.94 \pm .006$ on a group of 200 subjects.

⁵Landis, Jacobson, and Gullette (15) find that the Woodworth Personal Data Sheet is one of the best available criteria of emotionality.

⁶Garrett and Schneck (9) find that the total score on the Personal Data Sheet does not give entirely satisfactory results. The analysis of separate items reveals that they are not all equally diagnostic; a few, in fact, do not differentiate at all between college freshmen and psychoneurotic soldiers.

The derivation and history of the introversion-extroversion (referred to as I.E.) scale used here is similar to that of the I.A. scale. It was standardized by Miss Heibredner (10) from the list of items which Freyd gives as symptomatic of the condition in question (7). The odd-even reliability coefficient for the I.E. scale is $.78 \pm .019$ on a group of 200 students. There is no overlapping of items be-

TABLE 3
RELATIONSHIP OF INFERIORITY ATTITUDE TO OTHER TESTS OF
EMOTIONAL ATTITUDES
Woodworth Questionnaire and Inferiority

	<i>r</i>	<i>N</i>	Woodworth questionnaire		Inferiority attitude	
			Av.	S.D.	Av.	S.D.
Men	$.64 \pm .04$	62	14.3	9.4	28.9	39.0
Women	$.48 \pm .04$	112	19.5	9.6	40.0	44.0

Intercorrelations between Inferiority Attitude, Introversion-Extroversion, and Worries

	S.L.A.* women		S.L.A. men		Engineers	
	T.C.† (<i>N</i> =250)	N.T.C.‡ (<i>N</i> =233)	T.C. (<i>N</i> =250)	N.T.C. (<i>N</i> =250)	T.C. (<i>N</i> =95)	N.T.C. (<i>N</i> =138)
I.A. and I.E.	$.19 \pm .04$	$.30 \pm .04$	$.30 \pm .04$	$.39 \pm .03$	$.33 \pm .06$	$.35 \pm .05$
I.A. and worries	$.58 \pm .03$	$.59 \pm .03$	$.51 \pm .03$	$.58 \pm .03$	$.69 \pm .04$	$.47 \pm .04$
I.E. and worries	$.17 \pm .04$	$.22 \pm .04$	$.26 \pm .04$	$.34 \pm .04$	$.39 \pm .06$	$.29 \pm .05$

Means and Standard Deviations of Scores on Inferiority Attitude Introversion-Extroversion, and Worries

	S.L.A.* women		S.L.A. men		Engineers	
	T.C. (<i>N</i> =250)	N.T.C. (<i>N</i> =233)	T.C. (<i>N</i> =250)	N.T.C. (<i>N</i> =250)	T.C. (<i>N</i> =95)	N.T.C. (<i>N</i> =138)
I.A.						
Mean	37.7	40.5	31.2	31.3	21.3	24.2
S.D.	41.8	39.4	42.1	43.4	44.5	41.1
I.E.						
Mean	-8.1	-5.8	-8.2	-4.4	-5.3	-4.7
S.D.	16.9	15.3	13.8	16.7	16.6	15.5
Worries						
Mean	40.1	39.2	37.6	37.2	31.9	33.4
S.D.	18.8	19.2	20.5	20.4	19.0	16.3

TABLE 3 (continued)

Intercorrelations between Overreaction and Inferiority Attitude and Introversion-Extroversion

	<i>N</i>	<i>r</i>
Inferiority complex and overreaction	112 women	$+.29 \pm .06$
Introversion-extroversion and overreaction	112 women	$-.17 \pm .07$

Means and Standard Deviations of Scores on Overreaction, Inferiority Attitude and Introversion-Extroversion

(112 women)

	Overreaction	Inferiority Attitude	Introversion- extroversion
Mean	23.2	40.0	-2.5
<i>S.D.</i>	12.8	44.0	15.0

*College of Science, Literature, and the Arts.

†Twin-City group.

‡Non-Twin-City group.

tween the I.A. and the I.E. scales used here.⁷ The two sets of items, however, are presented to the subjects in the Minnesota College Entrance Examination as one continuous Personal Traits Rating Scale and are later scored and treated separately.

The fourth measure of emotional attitude is not a separate test, but rather the utilization of a characteristic occurrence in the I.A. test itself. Miss Heidbreder observes (11) that there is a tendency for those with high I.A. scores to mark the extremes of the scale, and for those with low I.A. scores to mark the middle of the scale. In the case of those with high scores, this tendency to overreaction holds both for traits characteristic of the I.A. and for their opposites; one might say that there is in these individuals the tendency to exaggerate, in rating themselves, any trait which they do possess. This overreaction hypothesis was tried out as follows: On a group of papers selected for the purpose (112 women registered in the laboratory psychology course), all the double pluses and minuses marked were counted, throughout the whole length of the Personal Traits Rating Scale, whether these were diagnostic of inferiority or

⁷The introversion-extroversion scale used in the present study contains not the full list of 54 items given by Freyd, but a revision made by Dr. Heidbreder on the basis of the statistical analysis of the original list. In the present scale, 31 items appear, selected from the original 54 for their diagnostic value. They are arranged on a five-step scale, similar to the inferiority attitude scale.

of its opposite, or not diagnostic at all. From this was subtracted the number of double signs marked which are diagnostic of the I.A. The latter was an attempt to eliminate a spurious correlation effect. The results of these subtractions, or the overreaction scores, were correlated with the I.A. scores.

The data on the four measures of emotional attitudes were correlated with the I.A. scores. The results are given in Table 3. The following conclusions can be drawn from these data:

- 1) On the whole, the I.A. shows a rather close relationship to other measures of general emotional instability. It is particularly interesting that it gives marked positive correlations which are statistically significant with the Woodworth questionnaire which is generally considered a measure of emotional instability.

- 2) The correlation between the I.A. and introversion-extroversion indicates that these two attitudes, as measured by these scales, are positively related. But the fact that the correlation coefficients are lower than the reliability suggests that they measure different patterns of emotional response.

- 3) The high correlations between worries and I.A. show the close relationship that exists between the self-estimated possession of various "troublesome" traits and the tendency to worry about them. Possessing these traits and worrying about them are, apparently, almost synonymous to the subject.

- 4) The correlation between overreaction and the I.A. confirms the expectations: there is a slight tendency for those troubled by the I.A. to mark the extremes of the scale, i.e., in all probability to exaggerate their own difficulties.

The slightly negative correlation between introversion-extroversion and overreaction supports the evidence given by Miss Heider that the introverts tend to mark the middle of the I.E. scale, while the extroverts tend to mark the extremes, and that at the same time the overreaction is characteristic of the I.A. On the face of it, it may seem strangely inconsistent that I.E. and I.A., two measures which correlate to the extent of about $+.30$, should correlate one positively, the other negatively with a third measure. The explanation may lie in some extraneous factor introduced into the situation. Thus Bender's (3) findings that the trait of "ascendancy-submission" correlates $.38$ with introversion-extroversion would be in harmony with the tendency of extroverts to overreact and of in-

troverts to underreact. The fact that the I.A. scale and the I.E. scale are related differently to the same measure is additional evidence that the two scales measure different patterns of emotional response.

5) All these measures afford an empirical basis for the statement that the scale measures an emotional attitude. Further, the intercorrelations suggest that the various types of response merge into one another, and that there are no sharp lines of demarcation between the various "types" of emotional traits and disturbances. It may be that they are all slight variations of a general "tender-mindedness."

III. INTERESTS IN RELATION TO THE INFERIORITY ATTITUDE

1) *Interests Associated with the Inferiory Attitude.* In overcompensation as it is generally described, the individual who suffers a real or imagined failure in one line of activity attempts to restore his self-respect by turning to some other activity where success is possible. One aspect of overcompensation might express itself in the type of interests developed by individuals who have feelings of inadequacy or insecurity in their contacts with people. We might expect a withdrawal into the self and a consequent overdevelopment of the intellectual life, an overemphasis placed on subjective values as a consequence of the lack of confidence in dealing with the concrete outer world. It is with these considerations in mind that a study of interests in their relation to the I.A. was undertaken.⁸

The technique used was similar to that which has been used by other investigators in the study of interest (5, 6). A list of interest items—vocational, recreational, etc.—is presented to the subjects, who are asked to record their subjective reactions to these interests in some standardized fashion. In the present study, a Minnesota modification of the Freyd Interest Blank (6) was used. After each item appear the letters *L D O U*, including 100 occupational and 100 miscellaneous interest items. The subject is to cross out *L* if he likes the item, *D* if he dislikes it, *O* if he is indifferent to it, and *U* if he knows nothing about it. The purpose of the study is to analyze the 200 interest items to find out whether any of the attitudes toward any of the interests are characteristic of the I.A. as here defined.

⁸Conklin's "Determination of Normal Extrovert-Introvert Interest Differences" (4) appeared while the present study was in progress.

The criterion groups were selected as follows: All I.A. scores falling above the 75th percentile were arbitrarily called the "Inferiority Group," and all those below the 25th percentile were called the "Non-Inferiority Group." Then 100 men's papers and 100 women's papers were chosen at random from each extreme, making up the upper and lower criterion groups respectively, 200 papers in each group. The data for the two sexes were kept separate until it became evident from the empirical findings that this was not necessary.

The responses of the 400 individuals to the 200 items were then tabulated, the percentage of individuals in the upper and lower criterion groups giving each response computed, the difference between the percentages of individuals in the upper and lower groups obtained, and the significance of this difference with respect to its

probable error determined.⁹ The ratio $\frac{\text{Diff.}}{\text{P.E.}_{\text{diff.}}}$ was the index of

the diagnostic value of the given item, i.e., of its ability to discriminate between the extremes of the distribution of the I.A. scores. The responses which were crossed out more frequently by the upper group were then called positively diagnostic, provided that the

$\frac{\text{Diff.}}{\text{P.E.}_{\text{diff.}}}$ reached a certain arbitrarily set critical value; those crossed

out more frequently by the lower group were called negatively diagnostic. The values of the $\frac{\text{Diff.}}{\text{P.E.}_{\text{diff.}}}$'s ranged from 0 to 7.

Table 4 gives the list of items which were found to give statistically significant differences¹⁰ for one or both sexes. It appears that the question asked at the outset with regard to interests can be answered in the affirmative: There do exist certain interest items which characterize the I.A. or its opposite. About half of the original items used do show differences for one or both sexes. Furthermore, this result appears under conditions least favorable to bring it out, as

⁹The computations were greatly facilitated by use of the Paterson and Edgerton tables of probable errors of ratios (16).

¹⁰The critical value was here set arbitrarily at $\frac{\text{Diff.}}{\text{P.E.}_{\text{diff.}}} = 3$.

TABLE 4

ATTITUDES TOWARD SPECIFIC INTEREST ITEMS WHICH CHARACTERIZE THE INFERIORITY GROUP

WOMEN			
<i>L—Like</i>	<i>D—Dislike</i>		
Miscellaneous	Miscellaneous		Inventor
Thin men	<i>Life</i>		Judge
Polite people	Algebra		Lawyer
Taking long walks	Arithmetic		Librarian
Checkers	Geometry		Newspaper reporter
Solitaire	Shop work		Novelist
Banquets			Philosopher
<i>Literary Digest</i>	Occupations		Poet
<i>Outlook</i>	Fisherman		Private secretary
<i>American Magazine</i>	Mathematician		Proofreader
<i>Merchant of Venice</i>	Ship officer		Psychologist
<i>Little Minister</i>	Surgeon		Scientist
Interviews			Singer
Organizing a play	<i>O—Indifferent to</i>		Social worker
Zoology	Nothing		Surgeon
Physiography			Translator
Geography	MEN	<i>D—Dislike</i>	
Domestic science	<i>L—Like</i>	Miscellaneous	
English composition	Miscellaneous	Fat men	
Grammar	Very polite people	Thin men	
Civics	Taking long walks	<i>Life</i>	
Commercial Subjects	Checkers	Geometry	
Public speaking	Detective stories	Civics	
	<i>New Republic</i>		
Occupations	<i>Outlook</i>	Occupations	
Actor	<i>Nation</i>	Automobile sales-	
Bacteriologist	<i>Oliver Twist</i>	man	
Consul	Addison's Essays	Electrical engineer	
Greek scholar	<i>Tale of Two Cities</i>	Factory manager	
Dramatic critic	<i>Idylls of the King</i>	Mechanical engineer	
Historian	Symphony concerts	Railway conductor	
Inventor	Grand opera	Stock broker	
Librarian	Arguing	Traveling salesman	
Magazine writer	Interviews		
Newspaper reporter	Zoology	<i>O—Indifferent to</i>	
Novelist	Geography	Miscellaneous	
Orchestra conductor	English composition	Nothing	
Philosopher	Spelling		
Poet	English literature	Occupations	
Painter		Mechanical engineer	
Proofreader	Occupations		
Singer	Artist	<i>U—Unknown</i>	
Social worker	Astronomer	Miscellaneous	
Grade school	College professor	Public speaking	
teacher	Consul		
Translator	Dietician	Occupations	
	Editor	Physicist	
	High school teacher		

the list was not planned for a possible indication of temperamental differences at all.

What does the inspection of the interests which characterize the contrasting groups tell us? What general picture does the I.A. present when viewed from this angle? In the first place, individuals characterized by the inferiority feeling incline to the more tenuous occupations. Liking for occupations such as those of writer, philosopher, reporter, artist, actor, and painter, college professor, and Greek scholar predominates. Among the miscellaneous items the selection is headed in the same general direction. We find there high school subjects related to language, literature, and science; recreations such as organizing plays, attending symphony concerts and grand opera, reading books and magazines, which for young people of this status might represent a certain "seriousness of mind." They dislike the magazine *Life*, and also dislike occupations which, according to Freyd's scheme, would classify them among either the socially or the mechanically inclined, both of which categories imply concrete contacts with either people or things.

The contrasting group, on the other hand, *dislike* some of the tenuous occupations listed above—the short but significant list consists of the items, artist, magazine writer, novelist, poet, college professor, and singer. However, they are indifferent to a variety of things. This, in fact, appears to be a striking difference between the groups: The inferiority group characteristically either likes or dislikes a variety of things; the non-inferiority group is largely indifferent.¹¹ This last result also lends support to the "overreaction" hypothesis referred to in Section II above. It might be an evidence of the "intensification of individuality" feeling which Adler considers to be one of the characteristics of the neurotically predisposed. Again, in the general psychological literature one frequently sees the statement that the neurotic reactions tend to have an affective tone out of all proportion to the objective situation.

In order to express quantitatively the characteristic attitude of an individual as recorded on the interest blank, a scheme was adopted for scoring interests according to their relation to the I.A. After trying out several preliminary scoring schemes, the one finally adopted included among its "scorable" items all items for which the differ-

¹¹This point is further substantiated by statistical analysis which is not included in the present article.

ence for both sexes lay in the same direction and for which the average $\frac{\text{Diff.}}{\text{P.E.}_{\text{diff.}}}$ for both sexes was at least 1.5. This scheme includes

items which show the same direction of interest for both sexes, but which are chosen predominantly by one sex only. This common scoring key for the two sexes was decided upon when it became evident that this procedure did not affect the validity of the scoring method. This combined key yields a total of 105 items for which one or more of the possible choices (*L D O U*) discriminated between the contrasting groups in the prescribed manner, making a total of 156 significant reactions, of which 96% have $\frac{\text{Diff.}}{\text{P.E.}_{\text{diff.}}}$'s

greater than 2. Then the blanks were scored by giving each "positively diagnostic" response checked the value of plus one, each "negatively diagnostic" response the value of minus one. The algebraic sum of these gave the total interest score.

The reliability and validity of the scoring scheme is given below. The reliability coefficients were obtained by giving the test twice, with an interval of six weeks. By validity is here meant the correlation of the interest scores with the I.A. scores on a random sampling of papers. The correlation coefficients are based on samplings of papers which do not include any of those used in the original criterion groups; the control and criterion groups are mutually exclusive.

TABLE 5
DATA ON INFERIORITY INTERESTS
Reliability

		<i>N</i>	<i>r</i>		
Men		200	.72±.02		
Women		200	.61±.03		
<i>Validity</i>					
		<i>N</i>	<i>r</i>	<i>r</i> corrected for attenuation	
Men		200	.39±.04	.57	
Women		200	.36±.04	.51	
<i>Averages and S.D.'s for Control Group</i>					
		I.A. scores		Interest scores	
		Av.	S.D.	Av.	S.D.
Men		+ 29.7	41.6	— 0.8	19.3
Women		+ 36.7	43.1	+13.3	18.5

After allowing for the unreliability of the tests used, the correlations for the control groups, .57 and .51, are not high. It must be remembered, however, that these particular interest items were used because they were conveniently available, and not because they were necessarily the best for the purpose. It was necessary to include in the key items whose diagnostic significance was relatively low, simply because by raising the requirements the number of "scorable" items would be made too small for adequate statistical treatment. Conklin's technique (4) for differentiating normal introverts from normal extroverts on the basis of interests suggests that with a more appropriate selection of interest items a more satisfactory characterization of the contrasting I.A. groups might be achieved.

Again, it will be remembered that the values of the diagnostic indices (ranging from 0 to 7, with only a few exceeding 4) indicate a very general tendency in the "expected" direction rather than a very specific and definite relationship. In spite of conditions that are far from favorable, it has been possible to obtain some quantitative statement of the extent to which the I.A. tends to be characterized by definite interest attitudes. In fact, the results are quite in character with the general trend of evidence. Apparently, "whatever the scale measures" is something very complex, which is related slightly to a variety of factors rather than to a single definite criterion.

2) *College Ability and Inferiority Interests.* In view of the general abstract character of the inferiority interests the question might arise whether possibly these interests are not more closely related to intelligence than to the I.A. It might be that these interests are more characteristic of the intelligent freshman than of one disposed toward the I.A. With this question in mind, correlations between inferiority interest scores and scores on the Minnesota College Ability Test were computed, using a random sampling of 200 men's papers and 200 women's papers. The correlations were found to be $-.08$ and $-.02$ respectively, with *P.E.*'s of .05. They do not reveal any relationship between the two variables. Certainly, intelligence as measured by the College Ability Test does not appear to be one of the factors that necessarily conditions the "intellectualistic" inclinations which tend to accompany inferiority feelings.

3) *Sex Differences in Inferiority Interests.* In the scores on the scales reported above—introversion-extroversion, Woodworth scale, —the sex differences are too slight to be significant, though they

TABLE 6
SEX DIFFERENCES IN INFERIORITY INTERESTS

	Men (N=187)	Women (N=77)	Diff.	P.E. diff.	$\frac{\text{Diff.}}{\text{P.E. diff.}}$
Av.	— 1.1	—11.8	12.9	1.7	7.4
S.D.	19.9	17.8			

do consistently show the women to be slightly more neurotically predisposed. But in the case of the inferiority interests the difference becomes pronounced. The figures are given in Table 6.

Women have apparently more of the interests which characterize the I.A. in general than do men. Considering the general nature of the interests which are being measured—interest in ideas rather than in concrete situations—this result may be interpreted as falling in line with sex differences reported elsewhere. Dr. Heidbreder reports that differences in attitude do exist independently of differences in introversion-extroversion (12). In particular, the following traits are characteristic of women:

Dislike and avoidance of any process of selling

Admiration of perfection in the form of literature

Preference for reading a thing rather than experiencing it

Conklin's data are also of interest here: he finds sex differences between *interests* which characterize introverts and extroverts to be so great that he advocates the establishment of separate norms for the sexes (4). The higher scores of women on our interest blanks constitute evidence of the same general trend.

4) Summary

a) The question whether any interests can be found that differentiate between the extremes of the I.A. distribution has been answered in the affirmative.

b) These differentiating interests refer to ideas rather than to concrete situations involving people or things.

c) The relation is one of a very general tendency in the direction indicated; few items are strikingly diagnostic, and the correlations with the criterion are not high.

d) Extreme attitudes of like and dislike are shown by the groups representing the I.A. to a high degree; the contrasting group is more likely to be indifferent.

e) There is no relation between interests so determined and intelligence as measured by the College Ability Test.

f) There are significant sex differences in the total interest scores, the women possessing more of the interests which are characteristic of the I.A.

IV. THE INFERIORITY ATTITUDE AND SOCIAL-ECONOMIC STATUS

Common sense indicates that money and social position might be causative factors in feelings of inferiority. The college situation, where students of all social strata are striving for recognition on the campus, presents an opportunity to study this relationship.

The entering students are required to state their parent's occupation on the personal history blank which they fill out when taking the College Ability Test. This information was used as the basis for classifying the students by social-economic status. A modification of the Taussig scale, worked out by the Institute of Child Welfare of the University of Minnesota, was used to classify the various occupations reported.¹² This six-fold classification consists of the following groups: (1) professional, (2) managerial and large business, (3) technical and clerical, (4) skilled trades, (5) semi-skilled trades, and (6) unskilled labor. Some difficulty was encountered in sorting out the students into these groups, as at times the information given was inadequate. After the students' papers had been classified in the appropriate categories, it was found that Groups 5 and 6 were so small in the college population that it seemed advisable to combine those two groups into one; this combined group will be referred to as Group 5.

The average I.A. scores for each one of the social-economic groups were then computed, keeping the sexes separate. The results are given in Table 7, and are graphically represented in Figure 1.

With one exception, it appears that the average I.A. scores increase as the social status goes down. The one exception is in the case of Classes 1 and 2, for both men and women, where the I.A. score is higher for Group 1 (professional) than for Group 2 (managerial). However, it must be remembered that the business and managerial class is probably on the average much wealthier than the professional class. If we change the order of these two classes,

¹²The full list of occupations in each group can be found in the appendix of Goodenough's "Kuhlman-Binet Tests" (10).

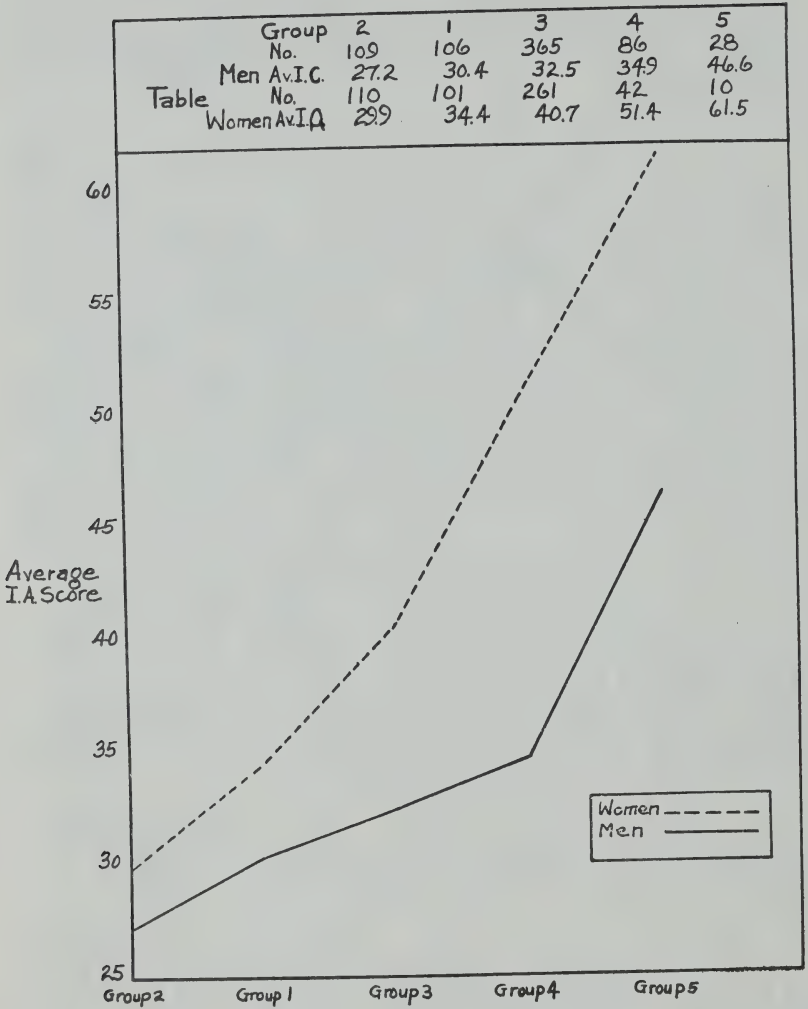


FIGURE 1

GRAPH REPRESENTING THE DISTRIBUTION OF AVERAGE I.A. SCORES BY SOCIAL-ECONOMIC GROUPS

TABLE 7

I.A. SCORES OF FRESHMEN ENTERING IN 1926 DISTRIBUTED BY SEX AND SOCIAL STATUS

		Group 1 Professional	Group 2 Managerial	Group 3 Technical and clerical	Group 4 Skilled trades	Group 5 Semi-skilled and unskilled
Men	No.	106	109	365	86	28
	Av.	30.4	27.2	32.5	34.9	46.6
	S.D.	46.9	45.7	42.2	41.2	43.7
Women	No.	101	110	261	42	10
	Av.	34.4	29.9	40.7	51.4	61.5
	S.D.	37.5	39.5	41.4	37.9	41.4

therefore, we shall have the occupational classes ranked approximately in order of wealth. If these results are represented graphically, in order 2, 1, 3, 4, 5, it will be found that the line connecting the average I.A. scores of the five groups rises steadily. In fact, the rise for the lowest two classes is steeper than that for the rest of the curve. The students in these two social classes make up about 15% of the college population. The remaining 85% who are superior in wealth and social status might be said to set the general tone of the social life of the campus by sheer majority rule. Speaking in very general terms we might say that Groups 4 and 5 are competing, or think they are competing, on unequal terms with their more fortunate classmates.

Since the number of cases in the last two classes is relatively small, and the results for this reason not very reliable, the students classified in these groups in the entering class of the following year were selected for further comparison. Groups 4 and 5, separately and together, were compared with the average score of Groups 1, 2, and 3 combined. The results of this comparison are given in Table 8.

Inspection of the table shows that 14 out of the 18 comparisons give differences that are at least 3 times as great as their probable errors, and in 9 cases the differences are 4 times as large or larger; thus when the results are checked on a larger group of cases, we find a consistent trend of evidence to show that the lower occupational classes have, on the whole, higher I.A. scores than the

TABLE 8
THE COMPARISON OF THE LOWER OCCUPATIONAL GROUPS WITH GROUPS 1, 2, AND 3 COMBINED

Freshmen entering in	Lower occupational classes						Groups 1, 2, 3, combined
	Group 4		Group 5		Groups 4 and 5 combined		
	Difference*	$\frac{Diff.}{P.E. diff.}$	Difference*	$\frac{Diff.}{P.E. diff.}$	Difference*	$\frac{Diff.}{P.E. diff.}$	
<i>Men</i>							
1926	No.	86	3.9	1.2	28	114	580
	Av.	34.9			46.6	38.4	31.0
	S.D.	41.2			43.7	41.7	43.8
1927	No.	121	8.7	3.7	21	142	605
	Av.	39.8			51.8	44.9	31.1
	S.D.	37.8			42.1	37.9	43.5
1926 and 1927	No.	207	8.0	4.0	49	256	1185
	Av.	39.1			48.8	41.9	31.1
	S.D.	39.4			43.3	39.9	43.6
<i>Women</i>							
1926	No.	42	16.4	4.0	10	52	491
	Av.	51.4			61.5	53.4	35.0
	S.D.	37.9			41.4	38.7	40.0
1927	No.	63	14.0	3.8	15	78	570
	Av.	50.5			39.5	48.5	36.5
	S.D.	43.5			33.9	42.3	41.1
1926 and 1927	No.	105	15.1	5.3	25	130	1061
	Av.	50.7			48.3	50.3	35.6
	S.D.	42.0			38.7	41.4	40.4

*Difference between average given in preceding column and the average of Groups 1, 2, and 3, given in last column.

wealthier classes. In fact, in most cases the differences are statistically significant when the two groups are combined.

We must remember, however, that this particular state of affairs is true for a state university in the Middle West. It may be that in another type of institution, such as Princeton or Harvard, Smith or Wellesley, the "line of demarcation" between those students who are and those who are not "socially acceptable" according to campus standards might come at some other point, and presumably higher up in the social scale. A preliminary analysis of the data obtained from Dartmouth College¹³ suggests that this may be the case.

To summarize, we may say that the analysis of the I.A. scale from the point of view of its relation to social-economic status suggests that the less socially acceptable part of a given population is more subject to the emotional attitude measured by the scale than the larger group which makes up the majority of the population and, so to speak, sets the standards for the group.

V. THE INFERIORITY ATTITUDE AS RELATED TO COLLEGE ABILITY AND ACHIEVEMENT

Intelligence has probably been emphasized more than any other single aspect of personality, especially as determining the general level of behavior. The assumption is that a certain amount of intelligence, which differs for different levels of performance, is a necessary but not a sufficient condition for success, but that, given the necessary minimum of intelligence, eventual success is closely bound up with certain unanalyzed personality factors. These unanalyzed "personality factors" certainly label, if they do not solve, a problem of both theoretical and practical importance. In the literature, feelings of inferiority, for example, are given credit both for being a spur to activity (Adler's "overcompensation") and, if the compensation is not successful, for leading to various degrees of disruption and disintegration.

The problem becomes an important one on the college campus. In studying the problems of adjustment of individual students, one frequently encounters cases which fit the theory. Thus one finds a student of low intelligence who strives to keep pace with his fellow-students by developing an extraordinary drive and compensating for

¹³The scale was given to groups of Dartmouth College students through the courtesy of Dr. Gordon Allport.

his intellectual inferiority by sheer amount of effort expended. Occasionally one meets with a student of high intelligence whose emotional maladjustments result in blocking his energy, so that his academic performance falls short of expectations. Finally, there is the brilliant student whose intelligence and academic performance are far above average, but whose emotional disturbances prevent him from making an adequate social adjustment. These illustrations are far from exhaustive of the type of problem one meets, but they indicate the complexity of the whole relationship between ability, achievement, and emotional adjustment. Another closely related problem is this: What part, if any, does tested intelligence play in emotional adjustment?

It is by reason of considerations such as these that a study of the relation of the I.A. scale to intelligence and to scholarship has been made.

1) *The Inferiority Attitude and the College Ability Test (C.A.T.)*. In conformity with the present tendency, the test of "general intelligence" used here will be referred to as the College Ability Test. This involves a minimum of assumptions as to the functions which the test measures. The test used is the Minnesota College Ability Test. It consists of four parts: the Moore completion test, an opposites test, and two vocabulary recognition tests. Its validity as measured by the correlation with scholarship is about .50, and its estimated reliability is at least .90.¹⁴ Percentile ranks on the test have been used in the statistical analysis.¹⁵

The test is given to all entering students as a part of the registration procedure. Correlation coefficients were computed between the raw scores in the I.A. and percentile ranks on the C.A.T. on several groups of freshmen. These were the men and women registered in the College of Science, Literature, and the Arts and men in the College of Engineering. These groups are further subdivided into Twin-City (Minneapolis and St. Paul) and Non-Twin-City groups, according to the location of the high schools from which the

¹⁴Unpublished data obtained from Professor Paterson.

¹⁵There is some theoretical objection to correlating percentile ranks, since they give a rectangular distribution, and not the normal distribution generally assumed in correlation. The procedure does not seem to affect the numerical results, as the correlations obtained on random groups of 250 men and 250 women are $-.13$ and $-.09$, respectively, when standard deviation scores on the intelligence test are used.

TABLE 9

CORRELATIONS BETWEEN RAW INFERIORITY ATTITUDE SCORES AND PERCENTILE RANKS ON THE COLLEGE ABILITY TEST

	S.L.A.* men		S.L.A. women		Engineers	
	T.C.† (N=250)	N.T.C.‡ (N=250)	T.C. (N=250)	N.T.C. (N=233)	T.C. (N=135)	N.T.C. (N=97)
<i>r</i>	— .19±.04	— .09±.04	— .09±.04	— .16±.04	— .05±.05	— .03±.05
Av. I.A.	31.2	33.3	37.7	40.5	21.2	24.1
S.D. I.A.	42.1	43.4	41.8	39.4	44.5	41.0
Av. C.A.T.	58.8	53.7	61.3	61.2	55.1	50.9
S.D. C.A.T.	28.6	29.2	26.8	26.8	28.5	29.1

*College of Science, Literature, and the Arts.

†Twin-City group.

‡Non-Twin-City group.

students come. The engineers were chosen because they are the largest homogeneous group of freshmen outside the S.L.A. College. The correlations are given in Table 9.

Only two of the six correlations are four times as large as their probable errors, and these are just barely large enough to make the correlations statistically significant. It seems that no very definite relationship exists between the two variables. It is to be noted, however, that all six correlations are negative, that is, in the direction of the higher I.A. scores being associated with lesser intelligence. Certainly there is no evidence in this study that feelings of inferiority are likely to be associated with superior intelligence.

Common sense suggests a possible double origin of feelings of inferiority in relation to intelligence. On the part of some, the feeling may be well grounded in a really inferior intelligence. On the other hand, others might have such feelings because of impossibly high standards. If such were the case, one might expect a greater variability in C.A.T. scores among those who score high on the I.A. scale than among those who score low. To test this hypothesis, groups of students who fell in the upper one-fourth and the lower one-fourth of the I.A. scale distribution were chosen, and standard deviations of their C.A.T. raw scores computed. The result appears in Table 10.

The differences, though they lie in the "expected" direction, are so slight that they cannot be considered adequate evidence for the hypothesis, so far as the measures used are concerned, and for a

TABLE 10

COMPARISON OF THE VARIABILITY IN THE COLLEGE ABILITY TEST* IN THE UPPER AND LOWER QUARTERS OF THE INFERIORITY ATTITUDE DISTRIBUTION

	Men		Women	
	Upper I.A. (N=172)	Lower I.A. (N=207)	Upper I.A. (N=149)	Lower I.A. (N=119)
Mean	238.2	256.2	249.6	263.9
C.A.T.				
S.D.	59.2	57.1	55.4	53.5
C.A.T.				
Difference between S.D.'s	2.1			1.4
Reliability of difference	0.5			0.4

*Raw scores on the College Ability Test are used in this table.

group which is highly selected and relatively homogeneous as far as intelligence is concerned.

2) *The Inferiority Attitude and Scholarship.* The grades for the fall quarter of the freshman year were used as the measure of academic achievement. The numerical index used to express scholastic standing is the "honor-point ratio." This is obtained by assigning arbitrarily to each quarter-hour of A work the point value of 3; B counts as 2, C as 1, D as zero, F as -1. The honor-point ratios range from -1 in case of failure in all courses, to 3 if A is earned in all courses.

Correlations between the honor-point ratios and I.A. scores are given in Table 11.

TABLE 11

CORRELATIONS BETWEEN INFERIORITY ATTITUDES AND HONOR-POINT RATIO

	Men		Women	
	T.C. (N=250)	N.T.C. (N=250)	T.C. (N=250)	N.T.C. (N=197)
H.-P. ratio and I.A.	-.03±.04	-.01±.04	-.10±.04	-.08±.04
H.-P. ratio and I.A., with C.A.T. constant	-.01	.05	-.06	-.03

Means and Standard Deviations

	Men				Women			
	T.C. (N=250)		N.T.C. (N=250)		T.C. (N=250)		N.T.C. (N=197)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
H.-P. ratio	.64	.95	.61	.90	1.03	.94	.93	.96
C.A.T.	58.8	28.0	53.7	29.0	61.3	26.8	61.2	26.8
I.A.	32.4	42.5	33.0	44.3	39.8	41.7	38.6	40.9

The raw correlations between I.A. and scholarship are all negative, that is, in the direction of superior scholarship being associated with lower I.A. scores. However, the absolute values of the correlation coefficients do not warrant any statement other than the fact that no definite relation is found to exist between the two variables. When intelligence is held constant, the correlations lose their appearance of minute but uniform tendency in the same direction. In other words, the effect of negative relation is probably produced by the factor of intelligence, which, it will be remembered, bears a very slight negative relation to the I.A.

Adler's theory of overcompensation might lead one to expect some difference in variability in the respective average achievement of the inferiority and non-inferiority groups. One might expect that in some individuals the feeling of inferiority might lead to overcompensation by showing academic prowess, while in others it might lead to discouragement, to abandoning all effort. If that were the case, the inferiority group would show a greater variability in achievement than the contrasting group. But the data yield no evidence for this hypothesis. As in the case of intelligence, the differences are in the expected direction, but far too slight to be significant.

It is possible, however, that the data used were not adequate to show a relationship that really does exist. The study of factors such as choice of courses, or achievement in particular courses, might bring to light some trend which has so far not been discovered. While some might compensate by achieving a higher scholarship, others might prefer to do so by shining in athletics or dramatics at the expense of scholarship.

TABLE 12

VARIABILITY IN HONOR-POINT RATIO IN CONTRASTING INFERIORITY ATTITUDE GROUPS

	Men		Women	
	Upper 25% I.A. (N=163)	Lower 25% I.A. (N=202)	Upper 25% I.A. (N=147)	Lower 25% I.A. (N=116)
Mean, H.-P. ratio	.55	.75	.92	1.14
S.D., H.-P. ratio	.94	.89	.91	.88
Difference between S.D.'s		.05		.03
Reliability of difference		.08		.05

VI. SUMMARY AND CONCLUSIONS

The purpose of this study was to find out something about the reaction measured by the Inferiority Attitude Self-Rating Scale by analyzing its relation to some other personal data. The results may be summarized as follows:

1) The scale is capable of revealing individual differences reliably. When given to large groups of college freshmen, it gives an approximately normal distribution, with a wide range shown by a coefficient of variability of 30%. This, together with a coefficient of reliability of .73, shows the scale to be capable of revealing individual differences in the attitude measured.

2) Women are, on the average, slightly more subject to the attitude measured than are the men. When very large groups are compared, the group difference becomes statistically significant, but it is too slight to be important in the interpretation of individual scores.

3) The scale reveals statistically significant differences between students in the College of Science, Literature, and the Arts and two other colleges in the University. The men in the College of Engineering are *less* subject to the I.A., according to the measure used, than men in the College of Science, Literature, and the Arts, whereas women in the College of Music are *more* subject to the I.A. than those in the College of Science, Literature, and the Arts. No statistically significant differences were found in the other colleges in the University as compared with the S. L. A. college.

4) The scale is definitely related to other scales of emotional attitudes. The correlations with the Woodworth questionnaire of .48 and .64 indicate that the scale is related to general emotional instability. The correlations with introversion-extroversion (ranging from .19 to .39) and overreaction (.29) indicate that the scale is also related, though less closely, to these special patterns of emotional attitudes. Possessing the various "inferiority" traits and worrying about them are apparently closely related in the minds of the students. (Correlations with worries range from .47 to .69).

5) It has been possible to find certain interests that differentiate between those who are and those who are not subject to the I.A. In general, the interests associated with the I.A. refer to ideas rather than to concrete situations, whether those situations deal with people or things. These interests, however, even though they have a cer-

tain "intellectual" character, are not related to college ability. Extreme attitudes of liking or disliking the given interest items are characteristic of the individuals who are subject to feelings of inferiority, while the attitude of indifference is characteristic of individuals at the opposite extreme of the I.A. scores distribution.

6) From the standpoint of *interests* characteristic of the I.A., there are large differences between the sexes. The average scores for interests of this sort are significantly higher for women than for men.

7) There is some relationship between social-economic status and the traits measured by the scale. The mean I.A. scores of the five occupational classes increase steadily from class to class as the economic status of the group goes down. The relationship stands out even more clearly when the lowest occupational classes are compared with the upper three, which make up a large majority of the total group. Most of the comparisons give significant differences between the representatives of the three upper and the two lower occupational classes.

8) The scale shows no definite clear-cut relationship to either college ability or academic achievement. It is to be noted, however, that the correlations with intelligence, though very slight, are consistently negative. The study of the variability of these two factors in the inferiority group shows no evidence of overcompensation.

On the basis of these results, then, we may say that the reaction measured by the scale studied is related to emotional attitude rather than to ability. It gives no significant relationship either with College Ability Test scores or with scholastic achievement. On the other hand, the uniformly positive correlations with measures of emotional instability, such as the Woodworth questionnaire and tendencies toward worry, introversion, and overreaction, suggest that it involves an affective attitude. Furthermore, the fact that it is more likely to occur in the lower social and economic classes of the college population, and that it is associated with interests suggesting a withdrawal from social contacts and from concrete situations, hint at the content of that attitude.

Except for the relation with general emotional instability and with worries, the relationship of the scale to other aspects of the total personality make-up is not very close. The significant thing seems to be that the scale is related to a number of factors. This number of low but positive relations points to the complexity of the

condition we are trying to measure. It cannot be identified definitely with any one thing, but apparently can be related to many. One might characterize it as a complex emotional attitude which may have its roots in a variety of factors, only a few of which have been investigated so far.

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UNE ÉTUDE DE L'ÉCHELLE D'ÉVALUATION MINNESOTA POUR
MESURER LES ATTITUDES D'INFÉRIORITÉ

(Résumé)

L'Échelle d'Évaluation Minnesota pour mesurer les attitudes d'infériorité a été appliquée à des groupes d'étudiants universitaires de première année, et on a étudié les résultats dans ses rapports avec d'autres données personnelles. L'étude montre que l'échelle concerne les attitudes émotionnelles plutôt que l'habileté, puisqu'elle ne montre aucun rapport significatif avec l'intelligence ou les notes des classes, mais elle montre d'ailleurs un rapport toujours positif avec la Feuille de Données Personnelles Woodworth, l'Introversiion-Extroversiion, les Inquiétudes, et la Sur-Réaction. L'Attitude mesurée par l'échelle se trouvera le plus souvent parmi les classes sociales inférieures dans l'université, et elle est associée aux intérêts qui suggèrent qu'on se retire des contacts sociaux et des situations concrètes.

FATERSON

EINE UNTERSUCHUNG DES MINNESOTA TEST (RATING SCALE)
FÜR MESSUNG DER INFERIORITÄTSHALTUNG

(Referat)

Man gab den Minnesotatest für Messung der Inferioritätshaltung Gruppen von erstjährigen Universitätsstudenten (College Freshmen) und untersuchte die Ergebnisse im Zusammenhang mit anderen persönlichen Data. Die Untersuchung zeigt, dass der Test eher auf gefühlsmässige Haltungen als auf Fähigkeiten Bezug hat; denn er weist keinerlei bedeutsame Beziehung mit Intelligenz oder College Zensuren auf, hat aber andererseits immer positive Beziehungen zu den Woodworth Blättern für die Ermittlung persönlicher Daten, Intraversiion-Extraversiion, Qualen und Überreizbarkeit. Die durch den Test gemessene Haltung kommt häufiger vor unter den niedern Gesellschaftsklassen der Universität, und sie ist im Zusammenhang mit Interessen die zu einem Rückzug von gesellschaftlichen Kontakten und konkreten Situationen verführen.

FATERSON

A STUDY OF TEMPERAMENT AND BLOOD-GROUPS*

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INTRODUCTION AND STATEMENT OF THE PROBLEM

The study and classification of human temperaments has occupied students from the time of Hippocrates. His classification of temperaments as sanguine, phlegmatic, choleric, and melancholic is well known. More recent classifications fall largely into two groups, the physiological and the psychological.

Temperamental differences are everywhere recognized and have recently been accepted as a most important problem in the field of education. Unfortunately we have no objective method by which temperament can be judged or measured.

The writer has attempted in this study to determine whether or not there is a relationship between temperament and a particular physiological characteristic, i.e., blood-type. If a relationship could be shown, it might prove a useful basis for the objective study of temperament.

Since the understanding of the elementary principles of the basis of blood grouping will make the following discussion more understandable, we first give a brief description of blood classification.

In 1899 an English physician, S. Shattock, observed the phenomenon of isohemo-agglutination, i.e., the agglutination of bloods when mixed, in his patients. Landsteiner, in 1901, reported that such a process also occurred in the blood of normal individuals, and, on the basis of differences observed in the agglutination, he classified human blood in three groups. After careful observation, Descatello, Sturli, Jansky, and Moss added a fourth group.

V. Dungern and L. Hirsfeld (13), in 1910, found that the human blood corpuscle contained two types of agglutinin, *A* and *B*, and that the serum contained two types of agglutinin α and β . They believed that hemo-agglutination occurred when *A* came in contact with α and *B* with β . On the basis of the presence of agglutinin, they distinguished four human blood-groups:

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- 1) *Gr.O.* (*ohne Agglutinin*)—Agglutinin α and β in serum, but no agglutinin in corpuscles.
- 2) *Gr.A.* Agglutinin β in serum, agglutinin *A* in corpuscles.
- 3) *Gr.B.* Agglutinin α in serum, agglutinin *B* in corpuscles.
- 4) *Gr.AB.* No agglutinin in serum, agglutinin *A* and *B* in corpuscles.

The relation between the serum and corpuscles of these groups and hemo-agglutination are as shown in Table 1.

We may now define the four blood-groups in terms of agglutination:

- 1) *Gr.O.* That which is not agglutinated by either the serum of *Gr.A.* or that of *Gr.B.*
- 2) *Gr.A.* That which is cohered by the serum of *Gr.B.* only.
- 3) *Gr.B.* That which is cohered by the serum of *Gr.A.* only.
- 4) *Gr.AB.* That which is cohered by either the serum of *Gr.A.* or that of *Gr.B.*

As the result of Furuhashi's (3) study of the heredity of blood-types, a further division of groups is possible. Furuhashi found that *Gr.O* is recessive in relation to *Gr.A* and *Gr.B*. *Gr.AB* is the heterozygote of *Gr.A* and *Gr.B*. *Gr.A* or *Gr.B* may be either homozygous or heterozygous, the heterozygous *Gr.A* and *Gr.B* types he named *Gr.A(O)* and *Gr.B(O)*. Therefore, we have six groups, as shown in Table 2.

TABLE 1

Blood corpuscle	$\alpha\beta$	Serum β	α	No.
<i>O</i>	—	—	—	—
<i>A</i>	+	—	+	—
<i>B</i>	+	+	—	—
<i>AB</i>	+	+	+	—

+ — hemo-agglutination.

— — no hemo-agglutination.

TABLE 2

Homozygote	Heterozygote
<i>Gr. O</i>	
<i>Gr. A</i>	<i>Gr. A(O)</i>
<i>Gr. B</i>	<i>Gr. B(O)</i>
	<i>Gr.AB</i>

In the phenomenon of isohemo-agglutination *Gr.A(O)* is combined with *Gr.A* and *Gr.B(O)* to *Gr.B*, so we cannot distinguish them directly but we can prove it from the relation of heredity.

For the technique of experiments on blood-groups, the reader is referred to (12).

THE EXPERIMENTAL STUDY

The purpose of the study was to determine the relationship between temperamental traits and blood-type.

A preliminary study was made with members of the author's family as subjects, and this seemed to reveal some evidence of a relationship between obvious temperamental traits and blood-type. From this preliminary study a list of characteristics was prepared as follows:

<i>Group a</i>	<i>Group p</i>
The person who	The person who
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">↓</div> <div> 1. is optimistic 2. resigns himself easily to his lot 3. does not mind being in the presence of others 4. is not diffident 5. is not scrupulous in decision 6. is gay 7. is sociable 8. is stout-minded 9. is not affected by outward stimuli 10. does not deviate from his opinion 11. is strong-willed </div> </div>	<div> 1. is meek 2. worries about the future 3. is slow to resign himself to his lot 4. is unwilling to be in the presence of others 5. is diffident 6. is scrupulous in decision 7. is shy 8. is sensitive 9. is easily affected by outward stimuli 10. does not stand to his opinion 11. is not strong-willed </div>

This list was given to 640 subjects with the following instructions:

Read the *Group a* and *Group p* in the direction of the arrow and give the mark (O) to the group to which you think you belong. If there is any characteristic in the opposite group which is characteristic of you give the mark (O) also.

The group of subjects included 188 persons between the ages of 27 and 70, who were relatives and friends of the author, and senior and graduate students of the Tokyo Women's Higher Normal School. The remaining 452 subjects were younger students of the Normal School and of the affiliated Girls' High School; their ages ranged from 16 to 21 years. Results are presented separately for these two groups. Table 3 presents results for the older group.

The "Common Characteristics" were arrived at for each group in the following way:

1) The majority of the subjects of the *Gr.O* group marked Group *a* as representing their temperamental characteristics, but a few marked Items 1 to 7 of Group *p* and Items 8 to 11 of Group *a*. Therefore, it was assumed that Items 8 to 11 of Group *a* were the ones common to both.

2) Items 1 to 7 of Group *p* were common to persons of the *Gr.B* group, but Items 8 to 11 were chosen almost equally from Group *a* and Group *p*. It seems that this may be related to the fact that *Gr.A* contains a homozygous group and a heterozygous group, Furu-kata's *Gr.A(O)*.

3) Items 1 to 7 of Group *p* were common to subjects of the *Gr.B* group, but Items 8 to 11 were again chosen almost equally from Groups *a* and *p*. This blood-group, it must be remembered, contains both heterozygous and homozygous groups.

From these data it appears that in these subjects certain temperamental characteristics seem to go with certain blood-groups. There are exceptions, of course, and the writer believes these may be due to such factors as education, environment, adaptation, etc., or to the segregation of the heterozygous groups *A(O)*, *B(O)*, and *AB* by Mendel's law of segregation, or to a combination of factors.

Table 4 shows the data for the younger group.

TABLE 3

RELATION BETWEEN BLOOD-GROUP AND TEMPERAMENTAL CHARACTERISTICS
OF 188 SUBJECTS AGED FROM 27 TO 70 YEARS

Blood-group	Common characteristics of the blood-groups	Number	Percentage
<i>Gr. O</i>	Items 8 to 11 of Group <i>a</i>	57	93.0
<i>Gr. A</i>	Items 1 to 7 of Group <i>p</i>	73	90.4
<i>Gr. B</i>	Items 1 to 7 of Group <i>a</i>	39	92.3
<i>Gr.AB</i>	Introspectively Group <i>p</i> Objectively Group <i>a</i>	19	84.2

TABLE 4

RELATION BETWEEN BLOOD-GROUP AND TEMPERAMENTAL CHARACTERISTICS
OF 452 WOMEN AGED FROM 16 TO 21 YEARS

Blood-group	Common characteristics of the blood-groups	Number	Percentage
<i>Gr. O</i>	Items 8 to 11 of Group <i>a</i>	134	82.8
<i>Gr. A</i>	Items 1 to 7 of Group <i>p</i>	182	76.4
<i>Gr. B</i>	Items 1 to 7 of Group <i>a</i>	101	57.4
<i>Gr.AB</i>	Introspectively Group <i>p</i> Objectively Group <i>a</i>	35	82.9

With this group it again appears that there is a fair degree of relationship between temperament and blood-type, with an exception in the case of *Gr.B*. However, as compared with the older group of subjects, this group shows less conformity in the relationship in question. It seems that this may be explained in part at least by the fact that many of the subjects were adolescents and hence physically and mentally unsettled. The "storm and stress" of this period is particularly marked in individuals of *Gr.B*.

From the data presented for the two groups of subjects we may conclude that there is a correlation between temperament and blood-type. The relationship seems to be shown in Table 5.

From observation the relationship between temperamental traits and blood-groups is as shown in Table 6.

The reason why the choleric temperament is omitted from our plan is that it so often appears temporarily in other temperaments. For instance, illness or loss of sleep brings on the irritable mood, which is characteristic of the choleric temperament, in almost any subject.

TABLE 5
RELATION BETWEEN BLOOD-GROUPS AND TEMPERAMENTAL TYPES
HOMOZYGOUS GROUPS

Blood-group	Temperamental characteristics	Temperament
<i>Gr. O</i>	Group <i>a</i> (Rarely Items from 1 to 7 belong to Group <i>p</i> .)	phlegmatic
<i>Gr. A</i>	Group <i>p</i>	melancholic
<i>Gr. B</i>	Group <i>a</i> (But Items from 8 to 11 belong to Group <i>p</i> .)	sanguine
HETEROZYGOUS GROUPS		
Blood-group	Temperamental characteristics	
	Principal	Subordinate
<i>Gr.A(O)</i>	Items from 1 to 7 of Group <i>p</i>	Items from 8 to 11 of Group <i>a</i>
<i>Gr.B(O)</i>	Items from 1 to 7 of Group <i>a</i>	Items from 8 to 11 of Group <i>a</i>
<i>Gr.AB</i>	Introspectively Group <i>p</i> Objectively Group <i>a</i>	

We may further classify temperaments as passionate and volitional, and, again, as dynamic and static. The relationships between these types and blood-groups are shown in Tables 7 and 8.

Although persons of *Gr.AB* usually appear objectively to be of the active, dynamic type, they usually state that they belong to the group characterized by the Group *p* traits. It would therefore appear that these individuals belonged to a mixed type as to forms of action.

TABLE 6

 RELATION OF BLOOD-GROUP, FORM OF ACTION, AND TEMPERAMENT
 HOMOZYGOUS GROUP

Blood-group	Temperamental characteristics	Temperament
<i>Gr. O</i>	Person who	phlegmatic
	1. is of strong will.	
	2. is not moved by stimulus.	
	3. is energetic.	
	4. is unyielding.	
	5. is firm.	
<i>Gr. A</i>	6. is seemingly docile but self confident.	melancholic
	Person who	
	1. is shy.	
	2. is docile.	
	3. is diffident.	
	4. is of worrying temperament.	
<i>Gr. B</i>	5. is reserved.	sanguine
	6. is deeply impressionable.	
	Person who	
	1. is frank.	
	2. is light-hearted.	
	3. is cheerful.	
<i>Gr. AB</i>	4. is sociable.	
	5. is quick in reaction but as soon cools down.	
	6. is attentive in everything.	

HETEROZYGOUS GROUP

Blood-group	Temperamental characteristics	
	Principal	Subordinate
<i>Gr.A(O)</i>	<i>Gr.A</i> melancholic	<i>Gr.O</i> phlegmatic
<i>Gr.B(O)</i>	<i>Gr.B</i> sanguine	<i>Gr.O</i> phlegmatic
<i>Gr.AB</i>	Introspectively <i>Gr.A</i> Objectively <i>Gr.B</i>	Person who has temperaments which contradict one another and, therefore, cannot be easily judged.

However, after careful observation the writer believes that they actually belong to the passive type and are introverts.

Summing up data from Tables 7 and 8, we find:

1) Persons of *Gr.O* are the opposite of those of *Gr.B* in feeling and will, but resemble them in the form of action as judged objectively.

2) Persons of *Gr.O* are the opposite of those of *Gr.A* in feeling, will, and in the form of action generally.

3) Persons of *Gr.A* are the opposite of those of *Gr.B* in the form of action, but resemble them in feeling.

4) Persons of *Gr.AB* are heterozygous as to *Gr.A* and *Gr.B*, and are the opposites of each other in the form of action.

Therefore it is difficult to judge the temperaments of *Gr.AB* individuals objectively. But, as in the point of feeling, both groups are common, such a tendency can be clearly recognized.

On the basis of the data presented above, we have worked out the accompanying classification of temperaments.

SOME APPLICATIONS

A Comparative Study of National Temperaments. The study of national character is an interesting one to psychologists. Mythology, tradition, religion, languages, art, history, and geographical relations of a people have hitherto been considered the materials of study of its national character. However, if our hypothesis that there is a close relationship between temperament and blood-type is true, this

TABLE 7
RELATION BETWEEN VOLITIONAL AND PASSIONATE TEMPERAMENTS
AND BLOOD-GROUPS

Volitional	Passionate	Principally Passionate	Subordinately Volitional
<i>Gr. O</i>	<i>Gr. A</i> <i>Gr. B</i> <i>Gr. AB</i>		<i>Gr. A(O)</i> <i>Gr. B(O)</i>

TABLE 8
RELATION OF ACTION TYPES TO BLOOD-GROUPS

Active and dynamic type	Passive and static type
<i>Gr. O</i> <i>Gr. B</i> <i>Gr. B(O)</i> <i>Gr. AB</i> (objectively)	<i>Gr. A</i> <i>Gr. A(O)</i> <i>Gr. AB</i> (introspectively)

THE CLASSIFICATION OF TEMPERAMENTS

Principal	Subordinate	Temperamental characteristics
Active type	1) <i>Gr. O</i> { internally and externally (or only internally)	phlegmatic unexcitable strong-willed self-confident self-acting unyielding obstinate selfish energetic
	2) <i>Gr. B</i> { mainly externally	sanguine bright social meddlesome soon hot and soon cold easy responsive nervous busy
	3) <i>Gr. B (O)</i> { Princ. resembles <i>Gr. B</i> Sub. resembles <i>Gr. O</i>	Principally resembles <i>Gr. B</i> Subordinately resembles <i>Gr. O</i>
Passive type	4) <i>Gr. A</i> { internally and externally	melancholic mild obedient worrying unyielding shy emotional undecided
	5) <i>Gr. A (O)</i> { Princ. resembles <i>Gr. A</i> Sub. resembles <i>Gr. O</i>	Principally resembles <i>Gr. A</i> Subordinately resembles <i>Gr. O</i>
Fixed type	6) <i>Gr. AB</i> { active (externally) passive (internally)	externally resembles <i>Gr. O</i> internally resembles <i>Gr. A</i>

should suggest a useful and important method of study of national character or temperament.

It is interesting at this point to examine blood-type records of the various national groups for which they are available and consider them in relation to a particular blood-group and its corresponding temperamental correlate. We shall take as our particular blood-group *Gr. O*, and study it in its relation to the phlegmatic temperament with which, according to our hypothesis, it is related. Table 9 shows the percentage of the various blood-groups in certain national groups.

It will be seen from this table that 29.5% of the Japanese, 31.3% of the Indians, and 32.6% of the Chinese are classed in *Gr. O*. With most of the European groups, however, this percentage is considerably greater. Temperamentally the Oriental peoples are inclined to be excitable, sensitive, and passionate, while the Europeans are more of the phlegmatic temperament as shown in their study of science, in their diplomacy, military affairs and other activities. It is also worthy of note that the peoples of the Far East have produced

TABLE 9
PERCENTAGE DISTRIBUTION OF BLOOD-GROUPS IN VARIOUS NATIONALITIES

Nation	Number	Gr.O	Gr.A	Gr.B	Gr.AB	A+B+AB
Japanese	18432	29.5	37.7	21.2	11.6	70.5
Indian	1000	31.3	19.0	41.2	8.5	68.7
Chinese	4428	32.6	31.4	27.3	8.7	67.4
German	17882	38.4	44.4	12.6	4.6	61.6
Italian	1932	42.0	42.1	11.6	4.3	58.0
Austrian	?	42.0	40.0	10.0	8.0	58.0
French	500	43.1	43.8	10.6	2.5	56.9
American	2536	46.3	38.9	9.5	5.2	53.7
Belgian	1972	47.9	41.8	7.1	3.2	52.1
English	3899	51.4	34.8	9.8	3.9	48.6

such excitable and passionate heroes as Kôu and Saigo Takamori and that they are venerated and idolized by the young people of the East, while in Europe we find such strong-willed heroes as Napoleon, Bismarck, Cromwell, and Mussolini.

Temperamental Characteristics of Local People. A second application of the hypothesis may be made to the temperaments of different groups of Japanese people. The contrasting temperaments of the people of the Northeastern District (Tôhoku Chihô) and of those of the Southwestern District (Kyushû Chihô) have been noticed by students. The former are said to be tenacious, the latter passionate. From data gathered by Dr. Kishi in the Northeastern District, by Dr. Furuichi and Dr. Kishi in Kagoshima, by Dr. Furuichi in Kumamoto, by Dr. Torii, Dr. Fukamachi, and Dr. Furuichi in Fukuoka, and by Dr. Tajima in Nagasaki, we may compare the blood-group records of these groups.

TABLE 10
PERCENTAGE DISTRIBUTION OF BLOOD-GROUPS IN TWO JAPANESE PROVINCES

	Province	Number	Gr.O	A+B+AB	$\frac{A+B+AB}{O}$	Average
					O	
Northeastern District	Morioka	386	34.9	65.1	1.9	2.1
	Yamagata	786	30.5	69.5	2.3	
	Akita	251	31.5	68.5	2.2	
	Aomori	69	35.8	64.2	1.8	
Southwestern District	Kagoshima	285	28.5	71.5	2.5	3.0
	Kumamoto	130	22.3	77.7	3.5	
	Fukuoka	357	23.7	76.3	3.2	
	Nagasaki	1000	27.9	72.1	2.6	

TABLE 11

PERCENTAGE DISTRIBUTION OF BLOOD-GROUPS IN STUDENTS OF TOKYO GIRLS' HIGHER NORMAL SCHOOL IN COMPARISON WITH GENERAL POPULATION

Group	Number	<i>Gr.O</i>	Blood-group		<i>Gr.AB</i>
			<i>Gr.A</i>	<i>Gr.B</i>	
Average Japanese	18432	29.5	37.7	21.2	11.6
Girls of Higher Normal School	126	36.5	34.1	22.2	7.2

For convenience of comparison we present the ratio $\frac{A + B + C}{O}$

in Tables 10 with the other data. These data indicate that the percentage of *Gr.O* individuals in the Northeastern provinces is greater than that in the Southeastern District. In the former *Gr.O* includes approximately one half the total of the $A + B + AB$ group, while in the latter the *Gr.O* includes approximately one third the number of the others. The fact that there are more *Gr.O* individuals in the Northeastern District also means that there are more heterozygous *Gr.A(O)* and *Gr.B(O)* individuals, according to Furuhashi's theory. Since these may have some of the *Gr.O* characteristics, it may mean that the persons having the corresponding phlegmatic temperaments are more numerous. This would not be so true of the peoples of the Southwestern District where *Gr.A*, *B*, and *AB* individuals are three times as numerous as are the *Gr.O*'s.

The Distribution of Blood-Groups in the Pupils of the Tokyo Women's Higher Normal School. Table 11 shows the relationship between the blood-type of 126 girls of the 1st and 2nd classes of the Tokyo Girls' Higher Normal School and that of the average Japanese population.

It must be remembered that from ancient times Japanese women have been considered inferior to the men, have made it their principle to be gentle and good, and have been ashamed of failure caused by their own active behavior. At the present time there are only two higher normal schools open to the graduates of 1200 girls' high schools. It is easy to suppose that the girls who come from the remote native villages and plan to take the difficult entrance examination would be of a strong-minded, steadfast type rather than of a

shy and negative type. Again supposing that our hypothesis of temperament-blood-group relationship is true, the above supposition is somewhat borne out by the fact that 36.5% of the girls belong to *Gr.O*, while 29.5% of the total population are in that group.

Distribution of Blood-Groups in a Military School. The authorities of a military school kindly consented to allow us to make blood tests of about 300 soldiers. We were particularly interested in the distribution of blood-types of 103 cadets who were to be commissioned officers and who had been selected from all the regiments of Japan. Table 12 shows the distribution of their types as compared with that of the average Japanese adult.

The predominance of *Gr.A* will be noted in this group.

An officer informed us that the desired characteristics of this group of cadets were that they be generally excellent in their special learning and attainments, be obedient, gentle, and sound in their nature. These temperamental traits are such as would be expected of persons of the *Gr.A* blood-type.

Distribution of Blood-Groups of Suicides. Suicide seems to go with the introverted and melancholic temperaments. In Prussia 963 boys and girls committed suicide between 1884 and 1898. Seventy-

TABLE 12

PERCENTAGE DISTRIBUTION OF BLOOD-GROUPS IN CADETS IN COMPARISON WITH THE GENERAL POPULATION

Group Average	Number	<i>Gr.O</i>	Blood-group		<i>Gr.AB</i>
			<i>Gr.A</i>	<i>Gr.B</i>	
Japanese	18432	29.5	37.7	21.2	11.6
Cadets	103	26.3	53.4	13.6	6.8

TABLE 13

CAUSES OF 488 CASES OF SUICIDE AMONG PRUSSIAN BOYS AND GIRLS

Cause	Boys	Girls	Sum
Regret, shame, and conscience	240	75	315
Vexation and strife	72	23	95
Passion	19	3	22
Satiety of life	13	3	16
Bodily suffering	14	4	18
Grief	11	2	13
Vice	6	3	9
Sum	375	113	
Total sum			488

six of these suicides were attributed to mental disease; the causes of the remaining 488 were given as shown in Table 13.

These data seem to indicate that there is a close relation between suicide and a certain type of temperament. The temperament seems to be that which we have decided belongs to *Gr.A* individuals.

Since we did not have the opportunity to investigate the problem, we asked students of forensic medicine to make some observations for us. So far only one case has been reported. A boy of 16 years committed suicide because he was "tired of living"; his blood-group was *Gr.A*. Another case has come to our attention, the case of a soldier who attempted suicide because of a trivial moral fault. The writer found his blood-group to be *Gr.A*.

The Blood-Type of Criminals, Street-Women, and the Mentally Deranged. Gundel (5) found in his recent study of the blood-types of criminals that the habitual criminal belongs to *Gr.B*. Street-women also belong to this group. Meyer (8) reports that among the manic depressive groups which he studied the proportion of persons of *Gr.B* was greater than that of any of the other groups, when compared with the average percentages for the population as a whole. This fits in well with our hypothesis, for the sanguine temperament goes with *Gr.B*.

CONCLUSION

We have shown that there seems to be a correlation between blood-type and temperament. It should, therefore, be possible to determine temperament scientifically without the subjective judgments of different observers. This should prove of value in various fields:

- 1) In education, especially in matters of discipline and vocational guidance.
- 2) In applied psychology, to the choice of vocations.
- 3) In folk-psychology, to the study of the character of peoples.
- 4) In medical science, to the problem of the relation between mind and body.
- 5) To eugenics, and to other mental and social phenomenon.

APPENDIX

An important recent study of temperament and character is that of Kretschmer and his students at the University of Tübingen in which they attempt to make a classification based upon physical constitution. Another interesting modern theory regarding tempera-

ment is that of some European students of medicine in which is stressed the influence of internal secretions upon temperament. These studies have rendered a great service to the science of character, and it is true that these theories have been established by careful experimentation and keen observation of eminent scholars and are worthy of attention, but I have some fundamental questions which I should like to raise concerning them.

1) In Kretschmer's study did his subjective classification agree with the results of introspection of the subjects?

2) With respect to the endocrine theory, the writer feels that the whole situation is similar to that mentioned above with regard to the loss of sleep and illness in producing temporary temperament traits of a choleric type. It seems to the writer that the disorder of function of the thyroid or generative glands has only such a temporary influence on a sound, healthy man, although it may produce an abnormal mental state. However, even if it is a fact that when, in Basedow's disease, the thyroid becomes abnormally active the patient becomes excessively sensitive and nervous, it seems that it would be committing the fallacy of affirming the consequence to conclude that a man of a highly nervous temperament must be suffering from disorder of the thyroid gland.

Another suggestive recent study is that of Yoshida, a student of medical jurisprudence in the Nagasaki Medical College, in which he found that such excretions as tears and sputum of persons of the same blood-group have similar qualities. This finding may furnish the basis for other objective studies of temperament.

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UNE ÉTUDE DE GROUPES CLASSÉS SELON LE TEMPÉRAMENT ET
LE SANG

(Résumé)

L'auteur a essayé dans cette étude de faire des corrélations entre certains types de tempérament et les divers groupes classés selon le sang. On a fait une étude expérimentale avec 188 sujets entre les âges de 27 et de 70, et avec 425 étudiantes de l'École Normale Supérieure pour Jeunes Filles, âgées de 16 à 21 ans. On a obtenu des évaluations du tempérament en faisant noter au sujet sur deux listes de traits caractéristiques ceux applicables à lui-même. Des données obtenues, on a conclu qu'il y a une relation entre le groupe classé selon le sang et le tempérament. En général, les gens du Gr. O sont flegmatiques, ceux du Gr. B, sanguins, ceux du Gr. A, mélancoliques, tandis que les Gr. A(O), B(O), et AB sont de tempérament mixte, bien que dans les deux premiers les mélancoliques et les sanguins sont dominants à l'égard des flegmatiques; et on a montré aussi que les Gr. A et B sont dominants à l'égard du Gr. O.

On cite de l'évidence qui semble soutenir la théorie qu'il y a une corrélation entre le groupe classé selon le sang et le tempérament, laquelle vient des études des tempéraments nationaux et des groupes classés selon le sang, des études semblables de certains groupes japonais, des criminels, des écoles militaires, etc.

FURUKAWA

EINE UNTERSUCHUNG DES TEMPERAMENTS UND DER BLUTTYPEN

(Referat)

Der Autor hat in dieser Untersuchung versucht, gewisse Temperamenttypen mit den verschiedenen Blutgruppen zu korrelieren. Man unternahm eine experimentelle Untersuchung mit 188 Versuchspersonen im Alter von 27 bis 70 Jahren, und mit 452 Studenten des Höheren Mädchenseminars (Girls' Higher Normal School), im Alter von 16 bis 21 Jahren. Man nahm die Schätzung des Temperaments vor, indem man die Versuchspersonen in zwei Listen von Charaktermerkmalen ihre eigenen anzeichnen liess. Aus den erhaltenen Angaben kam man zum Schluss, dass eine Beziehung zwischen Temperament und Blutgruppen bestehe. Im Allgemeinen sind Leute der Gr.O phlegmatisch die der Gr.B sanguinisch, die der Gr.A melancholisch, währenddem die der Gr.A(O), Gr.B(O) und Gr.AB gemischte Temperamente besitzen, obschon in den zwei erstgenannten das melancholische und sanguinische in Bezug aufs phlegmatische vorherrscht; ebenso ergab sich, dass Gr.A und Gr.B in Bezug auf Gr.O vorherrschen.

Man zitiert Beweismaterial von heimischen Temperament- und Blutgruppenstudien, von Arbeiten über japanische Gruppen, über Verbrecher und Militärschulen, etc. welche die Theorie unterstützen, dass eine Korrelation zwischen Blutgruppen und Temperament bestehe.

FURUKAWA

A STUDY OF PLAY IN RELATION TO PUBESCENCE*¹

From Ohio University and the University of Kansas

HARVEY C. LEHMAN AND PAUL A. WITTY

Students of child growth have been attempting for many years to determine and to express with quantitative exactness the relationship between the child's stage of physiological development and his status in certain behavior manifestations. Since both types of measurement present difficulties, statements of precise relationships are rarely found. If physiological growth proceeded at an identical or even approximate rate for all children, the problem would be simplified. It is, however, complicated by enormous individual differences in rate of growth. Illustrative of the wide individual differences in physiological growth are data assembled by Engstrom (8, p. 3) regarding age of first menstruation. Of 3,500 Finnish subjects studied by Engstrom, two experienced their first menstruation at the age of eight, and one did not menstruate until at the age of twenty-six. This range (18 years) exemplifies how great are individual differences in this regard.

In view of such wide differences in physiological development, it seems plausible that differences in physiological maturation may be related positively to differences in the maturation of certain behavior manifestations. In a previous article, one of the writers (9) presented data showing a relationship between the onset of pubescence in girls and the decline of girls' interest in doll play. Using data assembled by the Baltimore Public Athletic League, the writer drew a curve showing the age of first menstruation for certain American girls; a second curve was drawn to show the percentage of girls of various age levels who indicated that they had participated in doll play during the course of one week.

In commenting on the above procedure, Paul H. Furfey (7) remarked that the point under consideration is not what proportion of children are interested in a given play activity, but rather what proportion *continue to participate* in the activity with the onset of pu-

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bescence. Furfey proceeded, therefore, to determine the number of 12-year-old boys who were interested in several play activities. He then computed the percentages of these children who retained interest in the several play activities at successive age levels. In making his computations, Furfey assumed, of course, that the present 12-year-olds will respond one year hence as the 13-year-olds now respond, that the present 12-year-olds will respond two years hence as the 14-year-olds now respond, etc. This assumption is necessary unless an identical group is tested from year to year.

In the judgment of the present writers, Furfey is quite right in his statement that attention should be fixed on the proportions that retain interest rather than upon the absolute percentages of children that participate in a given play activity. The reason for this follows. The onset of pubescence is something that takes place in every normal child. Individual differences in play interests are so great, however, that no one play activity is participated in by *all* children during the course of one week. Because of this fact, if two curves be drawn, one representing the onset of pubescence and the other the waning of a given play interest, it is clear that these two curves will not be comparable since the play curve will not start at the 100% level. Therefore the parallel existing between the waning of interest in a given play activity and the onset of pubescence is always partially obscured by individual differences in play interest unless the number of interested pre-adolescents is taken into account. The present writers have re-examined, therefore, a large amount of their data. The result has been that they find a remarkable parallelism between the waning of numerous play interests and the onset of pubescence.

The data with reference to play behavior were procured as follows: Over 5,000 children were asked to check from a comprehensive and catholic list of 200 play activities *only those* activities in which they had participated voluntarily during the preceding week. The directions were specific; the teachers were instructed in giving the tests; and the data were obtained from unselected school children in order that the results of the investigation might be reliable. Data were secured from children in the following Kansas towns: Kansas City, Lawrence, Bonner Springs, and Moran.

In order that seasonal differences might be taken into account, the list was checked by the above groups on each of three dates, Nov. 7, 1923, Feb. 20, 1924, and Apr. 30, 1924. The same list of activities was checked on each of these dates and the same procedure in admin-

TABLE 1
NUMBER OF CHILDREN INCLUDED IN THREE STUDIES OF PLAY BEHAVIOR

Ages	Boys				Girls			
	Nov. 7 1923	Feb. 20 1924	Apr. 30 1924	Total	Nov. 7 1923	Feb. 20 1924	Apr. 30 1924	Total
8½	98	90	80	268	100	97	99	296
9½	169	161	114	465	174	139	144	457
10½	182	169	160	511	215	199	176	590
11½	187	167	184	538	235	222	220	677
12½	249	201	176	617	326	289	266	881
13½	280	231	259	770	269	235	263	767
14½	274	252	238	764	301	282	278	861
15½	230	247	247	724	261	244	256	761
16½	210	181	193	584	251	223	235	709
17½	145	130	146	421	182	208	193	583
18½	115	170	130	415	120	174	167	461
19½	95	119	102	316	101	115	93	309
20½	50	73	59	182	73	124	76	273
21½	53	57	43	153	41	85	66	192
22 & above	79	105	68	252	44	114	68	246

istering the test was used in each testing. The number of individuals from whom play data were obtained is indicated in Table 1.

The data regarding the onset of pubescence in girls were secured by other investigators (4, 1, 2). Table 2 and Figure 1 show the age of sexual maturing for six groups of American girls; data are expressed in percentage by a cumulative frequency distribution. Although the onset of pubescence varies somewhat from group to group, individual differences within the various groups are similar. When curves are drawn to show the variability in age of onset of pubescence, one finds these curves practically parallel (see Figure 1). Insofar as the present discussion is concerned, this parallelism is most significant.

Since most of the girls for whom data are presented in Table 2 were prepubescent until age 10½, the writers have used 10½ as the basal year and have expressed their data in percentages from age 10½ to 16½. Figure 2 gives data for doll play. At age 10½, 57% of the girls indicated that they had played with dolls during the course of one week.² In Figure 2 the writers have indicated, therefore, the proportion of these girls who continue to participate in this activity at successive age levels. Like Furfey, the writers have assumed that the present 10½-year-old girls will respond next year as do the 11½-year-old girls, etc.

²In the present paper all data with reference to play behavior represents the *average* of the results obtained from three investigations. See Table 1.

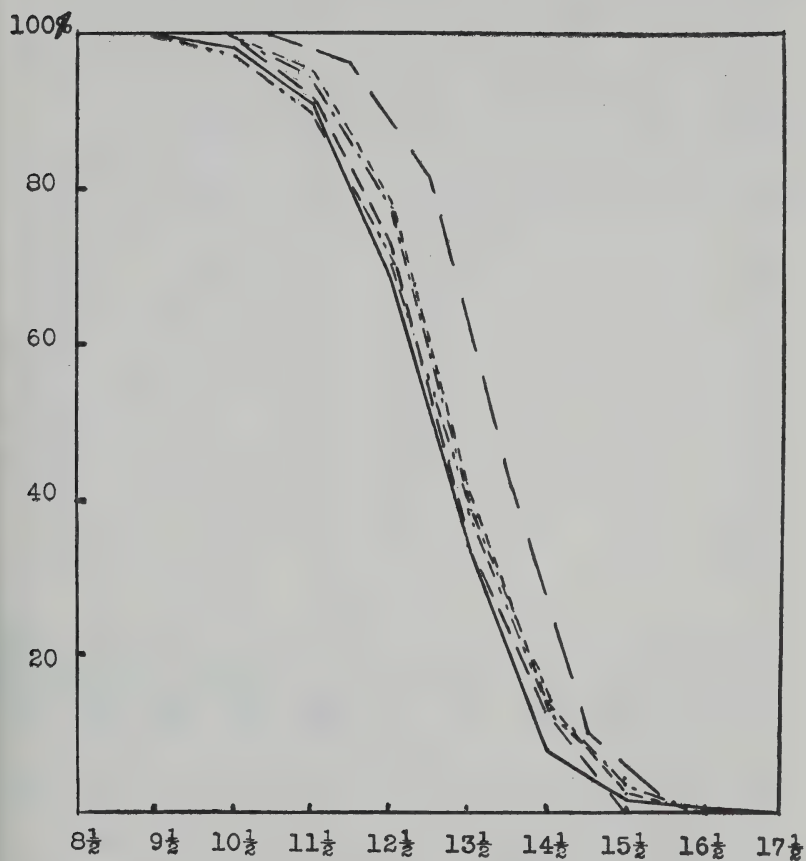


FIGURE 1

AGE OF SEXUAL MATURING FOR SIX GROUPS OF AMERICAN GIRLS

(See Table 2)

Group No. 1 -----
 Group No. 2 -----
 Group No. 3 -.-.-.-.
 Group No. 4 -.-.-.-.
 Group No. 5 -----
 Group No. 6 -.-.-.-

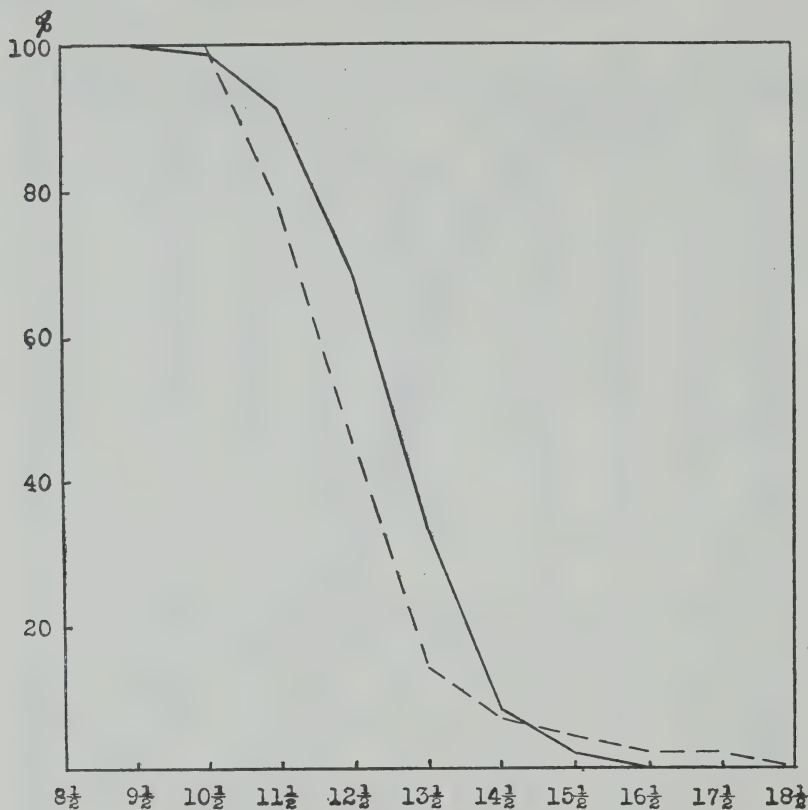


FIGURE 2

THE PROPORTION OF GIRLS WHO CONTINUE TO PLAY WITH DOLLS AT SUCCESSIVE AGE LEVELS *vs.* THE PROPORTION WHO HAVE REACHED PUBESCENCE

Percentage of girls who have reached pubescence —————
 Percentage of girls who continue to play with dolls at successive age levels - - - - -

In Figure 2 the solid line represents the percentage of girls who have reached pubescence at various ages. Data for constructing this curve were assembled by Abernathy (1). Figure 2 shows that there is a very close relationship between the onset of pubescence in girls and the waning of their interest in doll play; this is particularly noteworthy since the data were assembled during different decades from entirely different groups of girls living in different communities.

The writers were in doubt as to whether chronological age $9\frac{1}{2}$ or

TABLE 2
AGE OF SEXUAL MATURING FOR SIX GROUPS OF AMERICAN GIRLS

Group No.	1	2	3	4	5	6
	Univ of Iowa El. & H. S. girls	Horace Mann El. & H. S. girls	Univ. of Chi. El. & H. S. girls	Balt. Co. Md. girls	Univ. of Chi. H. S. girls	Amer. H. S. girls
Ref. No.	(4)	(4)	(4)	(4)	(1)	(2)
No. of cases	47	151	56	134	487	6,875
Ages	Cum.f.%	Cum.f.%	Cum.f.%	Cum.f.%	Cum.f.%	Cum. f.%
10						
10½				2.23	1.03	
11						
11½	8.51	4.63	5.35	9.69	8.63	
12						3.20
12½	27.65	21.18	21.41	29.83	31.62	
13						18.50
13½	65.94	58.26	60.69	59.67	66.94	
14						58.00
14½	87.21	86.07	85.69	86.52	92.20	
15						89.40
15½	99.97	97.32	96.40	96.22	98.16	
16						98.70
16½		99.96	99.97	99.94	99.79	
17						100.00
17½					100.00	

age 10½ was the more suitable basal age. They, therefore, made computations for each activity using both 9½ and 10½ as basal ages. In most instances the parallelism of the curves was not affected materially by the basal age used.

Forty-seven graphs were secured in which the parallelism between the play curve and the pubescent curve was remarkably close. The cost of reproducing these graphs makes their publication impossible. In Table 3, however, data for the 47 girls' play activities are presented. The first column of Table 3 shows the actual percentages of 10½-year-old girls who indicated that they had participated in the given play activity. The remaining columns indicate what percentage of these girls continue to participate in a given play activity at each year beyond age 10½.

The fact that the present writers wish to emphasize is that of *parallelism* between the onset of pubescence and the waning of numerous play interests. Whether in general the waning of play interest occurs at, shortly before, or shortly after the onset of pubescence, the writers are not prepared to state. Since, for groups of children,

TABLE 3

JUVENILE PLAY ACTIVITIES WHOSE WANING PARALLELS THE ONSET OF PUBESCENCE IN GIRLS

Percentage	Activity	Ages—	10½	11½	12½	13½	14½	15½	16½
66	Cutting paper things with scissors	100	80	73	44	33	27	15	
57	Playing with dolls, doll carriages, doll clothes, etc.	100	77	44	14	7	4	2	
54	Just running and romping	100	93	76	44	35	28	13	
54	Playing school	100	72	54	28	13	4	2	
51	Running races	100	84	73	55	37	24	16	
46	Hide and seek	100	74	65	41	22	13	4	
45	Jumping or skipping rope	100	78	62	42	24	9	7	
39	Playing house	100	62	26	10	3	0	0	
38	Other tag games*	100	79	66	45	21	11	5	
38	Dressing up in older folks' clothing	100	71	71	47	26	21	10	
37	Hop, skip, and jump	100	70	46	27	14	11	3	
34	"Here I come." "Where from?"	100	68	65	38	18	9	3	
34	Playing movie actress	100	79	70	38	26	21	9	
31	Jacks	100	77	48	32	19	10	3	
30	Pussy wants a corner	100	67	53	23	13	7	3	
27	Follow your leader	100	81	78	41	26	11	4	
27	Tin-tin	100	67	70	48	33	22	4	
26	Hop-scotch	100	88	69	38	15	15	8	
24	Playing teeter-totter	100	63	46	17	13	8	4	
24	London bridge	100	67	46	29	13	4	0	
23	Drop the handkerchief	100	61	52	39	17	17	4	
22	Other toys*	100	68	45	9	5	5	0	
21	Playing store	100	57	48	19	5	0	0	
20	Hide the button	100	90	65	40	20	15	0	
20	Hide the thimble	100	85	65	45	15	10	5	
20	Playing Sunday school	100	50	50	20	10	5	0	
19	Jumping for distance	100	79	74	32	42	11	5	
18	Playing other make-believe games	100	89	67	33	22	6	0	
18	Other singing games*	100	67	56	33	28	14	6	
17	Crack the whip	100	76	71	47	24	18	6	
17	Blind man's bluff	100	71	65	35	24	12	6	
17	Jumping for height	100	71	53	47	25	18	18	
17	Playing church	100	53	47	24	12	6	0	
15	Other hopping games played on the sidewalk*	100	80	67	20	20	13	7	
15	Making mud pies, mud dolls, etc.	100	53	27	7	7	0	0	
14	Old witch	100	71	52	29	14	14	7	
14	Other ring games*	100	93	57	43	21	14	7	
14	Bean bags	100	71	71	43	36	7	7	
13	Run sheep run	100	85	69	46	31	15	0	
13	Sliding on a playground slide	100	77	54	23	15	23	15	
12	Dodge ball	100	75	67	67	42	25	8	
12	Statuary	100	67	42	14	14	8	0	
12	Blackman	100	58	58	42	25	17	8	
10	Coasting on a coaster	100	90	60	40	30	10	10	
10	Playing nurse	100	80	50	30	10	10	0	
10	Leap frog	100	70	40	30	20	10	10	
9	Fox and geese	100	78	56	22	11	11	0	

*Certain of the above items will be best understood in their original context. (See 10, pp. 37 ff.)

TABLE 4

JUVENILE PLAY ACTIVITIES WHOSE WANING PARALLELS THE ONSET OF
PUBESCENCE IN BOYS

Percentage	Activity	11½	12½	13½	14½	15½	16½	17½
48	Just running and romping	100	92	69	40	29	19	15
45	Climbing porches, trees, fences, posts, etc.	100	91	76	53	31	16	7
33	Cutting paper things with scissors	100	79	48	27	15	6	6
29	Playing cowboy	100	72	42	17	10	0	0
28	Coasting on a wagon	100	82	62	43	25	7	4
26	Hide and seek	100	77	50	22	15	8	5
25	Follow your leader	100	72	68	36	20	4	8
24	Other tag games*	100	79	50	25	13	4	4
22	Swinging	100	86	73	45	27	14	14
22	Playing Indian	100	59	32	9	5	0	0
22	Coasting on a coaster	100	91	55	27	18	0	0
21	Pillow fights	100	71	52	43	24	14	14
21	Mumbly peg	100	95	67	48	29	19	5
20	Rolling an auto tire	100	75	55	30	15	10	10
19	Robber and police	100	63	37	16	5	0	0
18	Walking on stilts	100	89	55	39	28	11	6
14	Digging caves or dens	100	86	79	50	36	14	0
14	Sliding on a playground slide	100	79	43	29	21	14	14
14	Spinning tops	100	71	57	29	21	7	0
13	Leap frog	100	92	62	46	22	22	22
13	Bows and arrows	100	62	62	22	15	15	8
13	Rolling a hoop	100	54	46	8	8	8	8
12	Playing bandit	100	92	58	17	17	0	0
12	Playing soldier	100	58	33	17	0	0	0
12	Toy trains, ships, autos	100	58	31	17	8	17	0
11	Crack the whip	100	91	64	27	27	18	9
11	Dodge ball	100	92	36	27	0	0	0
11	Other toys*	100	55	27	27	0	0	0
10	Three deep	100	100	40	30	10	10	10
10	Tin-tin	100	80	40	30	20	0	0
10	Playing store	100	60	30	0	0	0	0
9	Andy-over	100	111	78	44	22	11	0
9	Run sheep run	100	111	56	56	22	0	0
9	Toy airplanes, balloons, etc.	100	89	67	44	22	11	0
9	Wading in the water	100	45	45	22	22	11	22
9	Playing horse	100	45	22	11	0	0	0
9	Playing on a giant stride	100	44	33	11	0	0	0
8	Building a dam	100	75	38	25	13	0	0
8	Dare base	100	75	50	38	13	0	0
8	Other make-believe games*	100	50	38	25	13	13	0
7	Other ring games	100	100	29	14	14	14	14
7	Blind man's bluff	100	86	43	29	14	0	0
7	Blackman	100	86	57	43	29	14	0
7	Train conductor, engineer, etc.	100	43	14	14	0	0	0
6	Fox and geese	100	83	50	17	17	17	0
6	Other hopping games*	100	83	50	17	17	0	0
6	Bean bags	100	67	67	50	17	0	0
5	Other singing games*	100	60	60	20	20	0	0

*Certain of the above items will be best understood in their original context. (See 10, pp. 37 ff.)

interest in some activities starts to decline beyond age $8\frac{1}{2}$; interest in others of them declines after age $9\frac{1}{2}$; and interest in still others decreases after age $10\frac{1}{2}$, it seems logical that interest in some of the 47 activities listed in Table 3 may start to wane shortly prior to the onset of pubescence; interest in certain others may wane with the onset of pubescence; and interest in still others may not wane until shortly after the onset of pubescence. Nevertheless, it is apparent that waning of interest in these activities agrees closely with the onset of pubescence.

In Figure 3 the writers have presented the percentage of $11\frac{1}{2}$ -year-old boys who indicated that they had participated in "playing cowboy" during the course of one week, and the proportion of these who continue to participate therein at successive age levels. In Figure 3 the solid line represents the percentage of boys who have become pubescent at various age levels. Data for making this curve was assembled by Crampton (5) for 3,835 New York City boys. Although, as previously mentioned, Furfey employed age 12 as the basal age in making his computations, the present writers are convinced (in the light of their data) that a younger age is more appropriate for this purpose. It is, of course, true that behavior manifestations show considerable variability in their waxing and waning. Although the waning of interest in the types of behavior herein studied corresponds closely to the onset of pubescence, it does not parallel *exactly* the biological phenomenon. Therefore allowance must be made for the variability in these behavior patterns. The attention of the reader will be attracted, nevertheless, to the similarity of the various curves and their close correspondence with the curves for the onset of pubescence.

In Table 4, 48 play activities are presented whose waning parallels closely the onset of pubescence. In Table 4 the writers have used age $11\frac{1}{2}$ as the basal age for the following reason: Crampton's data show that from 15 to 20% of New York City boys become pubescent prior to age 12. It seems illogical, therefore, to assemble play data for 12-year-old boys and then to assume that the data represent the play behavior of pre-adolescents. Data originally assembled by the Baltimore Public Athletic League for 3,600 city boys and for 1,317 country boys are presented by B. T. Baldwin (3) in the *15th Year-book of the National Society for the Study of Education*. These data also reveal quite clearly that the pubescent curve for boys starts to descend quite perceptibly *prior* to age 12.

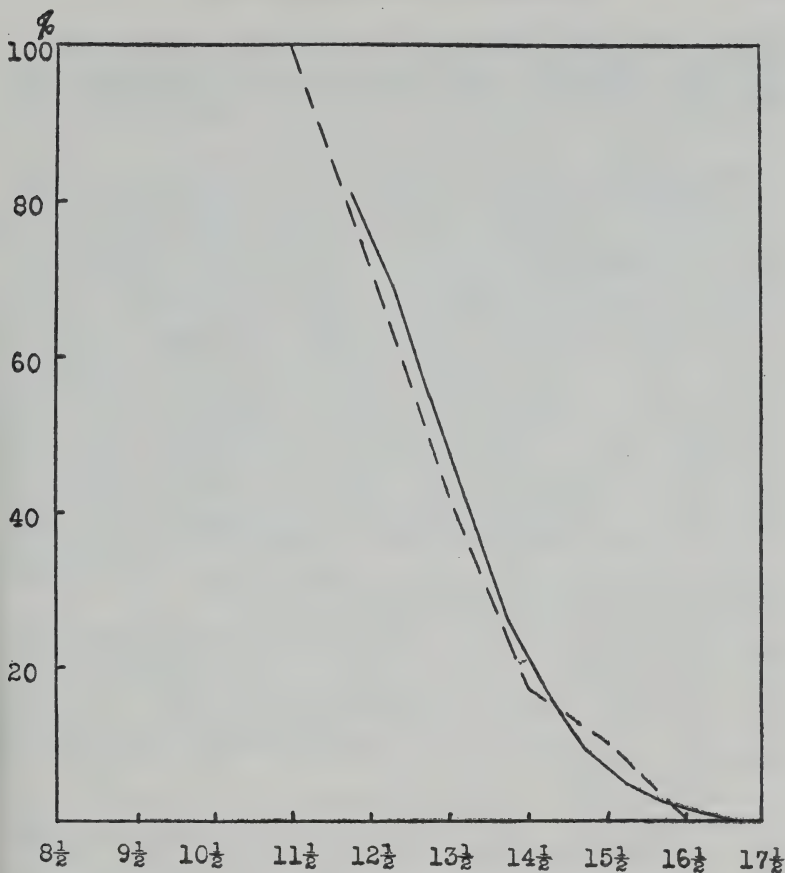


FIGURE 3

THE PROPORTION OF BOYS WHO CONTINUE TO PARTICIPATE IN "PLAYING COWBOY" AT SUCCESSIVE AGE LEVELS *vs.* THE PROPORTION WHO HAVE REACHED PUBESCENCE

Percentage of boys who have reached pubescence —————
 Percentage of boys who continue to participate
 in "playing cowboy" at successive age levels - - - - -

Despite the above facts it is rather dangerous to assume *a priori* that *any* age level is most suitable as a basal age from which to make computations. This becomes apparent when one realizes that pubescence varies from group to group. The writers therefore computed their data for the activities listed in Table 4 using both $10\frac{1}{2}$ and

11½ as basal ages. Although in many instances general results did not differ when either of these two ages was used as the basal age, age 11½ appeared on the whole to be the more appropriate basal age.

FURTHER REMARKS

The juvenile play activities presented in Tables 3 and 4 are somewhat generally participated in by pre-adolescent boys and girls and their disappearance tends to parallel the onset of pubescence. Although, as mentioned by Furfey, it is hazardous to generalize too freely with regard to such findings, one must recognize that the onset of pubescence is intimately associated with the waning of these activities. It is difficult to adduce unequivocal evidence which shows that the onset of pubescence is a cause of cessation of interest in numerous plays and games. The children themselves could hardly be expected to explain their loss of interest in these activities. Questioning the children as to their "reasons" for giving up these activities would yield partial and unreliable explanations only. Interesting in this connection is the list of "reasons" advanced by girls for ceasing to play with dolls. The following "reasons" were collected by A. C. Ellis and G. Stanley Hall (6, p. 156):

"In the supplementary papers 55 stopped playing with dolls because they liked other things better; 50 ceased to care for them without being able to give a reason; 45 stopped because they were too old; 44 because too large; 22 because too busy and had no time; 15 because ashamed; 11 because love a real baby. Others gave their dolls away, preferred new playmates, were made to stop, dolls were worn out, etc."

It is clear today that such "reasons" are often rationalizations and forced responses; that girls are probably unaware of why they give up a given play interest. One may say however that the children's interest in certain play activities seems to parallel closely the stage of their physiological development.

The data here presented show that there is no single age level at which the sudden cessation of interest in a given play activity occurs for all children; neither is there any single age level at which the onset of pubescence occurs for all children of the same sex. Individual differences in both regards are conspicuous and marked. These individual differences are made evident by the gradations with which both curves approach the base line in Figures 1, 2, and 3.³ It will

³The fact should be borne in mind that the play data presented in the present article were assembled for *groups* of children. The problem of whether a given child experiences sudden changes in play interests is one that the writers have not investigated.

be noted in Figure 2 that the curve representing participation in doll play rises slightly above the pubescent curve at the right end of the graph (at the higher age levels). This characteristic occurred so frequently in the play curves that it deserves special comment. The tendency for the play curve to persist at the higher age levels longer than the pubescent curve was noticeable in 45 of the 47 graphs for the girls and in more than 75% of the 48 boys' graphs. The following hypotheses or some combination of them may explain this tendency: (1) It may be that this phenomenon is merely illustrative of the fact that, like other habits, play habits tend to persist. (2) It may be that environmental factors force some children either to play games in which younger children ordinarily engage or to take part alone. The writers (10) have discussed previously the way in which environment brings about such a condition. (3) Older school children are a selected group. Some selective factors may, therefore, be the causal factor. (4) The method used for computing the data of Tables 3 and 4 may exaggerate the slowness with which a given play interest wanes.

Nature of pre-adolescent play. Much has been said and written regarding the play of the pre-adolescent child. The pre-adolescent has been characterized as an extreme individualist. This characterization is likely to produce inaccurate thinking regarding the pre-adolescent's individualistic tendencies. It is true that many of the activities listed in Tables 3 and 4 may be indulged in without companionship, and that most of those which require companionship permit individual achievement and individual victory rather than group achievement and group victory. From this point of view, therefore, many pre-adolescent play activities may properly be termed "individualistic." Nevertheless, the critical student must not lose sight of the fact that Tables 3 and 4 contain only those pre-adolescent play activities which *wane* with the onset of pubescence. Many other play activities such as baseball and football, which are participated in by pre-adolescents, do not die out so suddenly. The latter require at least some semblance of team-work and the pre-adolescent's play life will be partially obscured if attention be confined solely to the play activities listed in Tables 3 and 4. The findings presented in this paper however will provide a wealth of thought-provoking material for the student of adolescence and for those interested in the psychology of interest.

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UNE ÉTUDE DU JEU DANS SES RAPPORTS AVEC LA PUBERTÉ

(Résumé)

Cet article discute le parallélisme entre la perte de l'intérêt dans certaines activités du jeu et l'arrivée de la puberté. On a obtenu les données sur le jeu de plus de 5.000 enfants à qui on avait demandé de noter sur une liste compréhensive et universelle de 200 activités du jeu seulement les activités auxquelles ils avaient participé volontairement pendant les huit jours précédents. D'autres investigateurs ont obtenu les données sur l'arrivée de la puberté.

Les auteurs ont identifié 47 activités de jeunes filles et 48 activités de garçons où la perte de l'intérêt semble être très parallèle à l'arrivée de la puberté. Bien qu'il soit difficile de citer de l'évidence non équivoque qui montre que l'arrivée de la puberté est une cause de perte de l'intérêt dans ces divers jeux et récréations, il faut reconnaître que l'arrivée de la puberté est prochainement associée à la perte de ces activités.

Les enfants eux-mêmes ne savent probablement pourquoi ils perdent un intérêt de jeu. On ne pourrait pas donc s'attendre à ce qu'ils donnent une explication rationnelle de leur perte d'intérêt dans ces récréations. On a trouvé que l'on obtient seulement des explications partielles et sans valeur quand on demande aux enfants leurs "raisons" pour la perte de ces récréations.

Les résultats de cette étude devraient donner beaucoup à penser à l'étudiant de l'adolescence et à ceux qui s'intéressent à la psychologie de l'intérêt.

LEHMAN ET WITTY

EINE UNTERSUCHUNG DES SPIELS MIT BEZUG AUF PUBERTÄT

(Referat)

Diese Arbeit diskutiert die Parallelität zwischen dem nachlassenden Interesse für gewisse Spieltätigkeiten und der heranbrechenden Pubertät. Die Angaben bezüglich Spiel erhielt man von über 5000 Kindern die gebeten wurden, jene Spieltätigkeiten einer umfassenden und universellen Liste von 200 solcher Tätigkeiten aufzuzeichnen, in denen sie die vergangene Woche freiwillig teilgenommen hatten. Die Angaben bezüglich der heranbrechenden Pubertät stammen von andern Forschern.

Die Autoren haben 47 Mädchen- und 48 Knabentätigkeiten identifiziert, bezüglich derer das nachlassende Interesse mit der heranbrechenden Pubertät nahezu parallel zu gehen scheint. Obschon es schwer ist, unzweideutige Beweise zu erbringen, welche zeigen, dass die heranbrechende Pubertät das Aufhören des Interesses in den verschiedenen Spielen verursacht, muss man wenigstens zugeben, dass die heranbrechende Pubertät mit dem Verschwinden dieser Tätigkeiten enge verbunden ist.

Die Kinder sind wohl kaum gewahr, warum sie ein bestimmtes Spielinteresse aufgeben. Man kann darum nicht erwarten, dass sie dafür eine rationale Erklärung produzieren. Fragen an die Kinder, warum sie diese Tätigkeiten aufgegeben haben, haben unfertige und unzuverlässige Erklärungen ergeben.

Die Befunde dieser Arbeit dürften eine Fülle anregenden Materials zum Nachdenken liefern für Forscher die sich mit der Jugend und solche, die sich mit der Psychologie des Interesses abgeben.

LEHMAN UND WITTY

SHORT ARTICLES AND NOTES

THE NEUROTIC PERSONALITY AND TRAITS OF SELF-EXPRESSION

GORDON W. ALLPORT

In this journal the Thurstones (3) offer a new neurotic inventory, constructed empirically from several miscellaneous schedules. Of the 223 items in the inventory, 11 are recognizably taken from the A-S Reaction Study, Form for Men (*J. Soc. & Abn. Psychol.*, 1928, **23**, 118-136), and three additional items from the Form for Women. The authors simply guessed that these items would be indicative of a neurotic make-up as well as of submission, and then by the criterion of internal consistency confirmed their guess.

They write, "The neurotic personality is one which fails somehow in the relation between imagination and external social reality," and add, "If imagination fails to express itself effectively on external social reality *it is only natural to expect that the social expressions of the personality will be inhibited*" (italics mine).

To determine whether submission, as one of the "inhibited expressions of personality" does really characterize the neurotic person, a group of 179 male students (mostly sophomores) was given both the A-S Reaction Study and the Thurstone inventory. The resulting r between submission and neurotic tendency was $+0.347 \pm 0.044$. This coefficient is, of course, to a degree spurious, inasmuch as 11 items appear identically in both scales. Removing these items from Thurstones' schedule, re-scoring, and re-correlating, $r = +0.254 \pm 0.047$. Although there is a tendency, as the Thurstones point out, for the neurotic personality to be inhibited (submissive) in social self-expression, it is by no means marked enough to justify identification of the concepts of neurotic make-up and submission. It appears that many neurotic students can still be ascendant, and many emotionally adjusted students can still be submissive.

In another connection the Thurstones affirm that "the less serious forms of neurotic maladjustment have the characteristics ordinarily known as introversion. In fact many of the differentiating questions are those frequently used for the description of introversion." It is clear that the authors have constructed an omnibus test, and consider the total result indicative of a neurotic or maladjusted personality. If one *wants* a total score for a personality (as deans apparently do), this method is obviously the one to use. But at the same time *the method blurs the contours in research concerning traits*. Within the total field of maladjusted habits (or within the inclusive neurotic "trait") there are integrated patterns which

can be distinguished. And though these less general "traits" overlap, they still have enough independence and enough internal consistency to justify differential research. [Cf. (1).]

In Table 1 there is presented a set of intercorrelations among the asthenic traits of self-expression. It will be seen that all the relations but one are positive, a phenomenon which can be attributed to (a) a common causal factor (e.g., partialling out "poor physique" in a series of similar correlations shows it to be a constant influence to the extent of $+.10$); (b) "weakness," "introversion," or "neurotic make-up," suggesting Spearman's general conative factor, w ; (c) a halo effect (since these correlations are based on rating studies); (d) overlapping in the construction of the scales; (e) a combination of these or other factors. The data for this table are derived from ratings of 18 persons by 17 carefully instructed raters.

TABLE 1

INTERCORRELATIONS BETWEEN "WEAK" TRAITS OF SELF-EXPRESSION

	Lack of sociability	Submission	Introversion	Selfishness	Conservatism	Lack of drive
Reclusiveness (in speech)	.26	.86	.40	.20	.21	.10
Lack of sociability		.47	.69	.40	.07	.20
Submission			.38*	.12	.22	.31
Introversion				.23	.00	.35
Selfishness					.04	.17
Conservatism						.27

*From Bender (2).

This table further demonstrates that some factor or factors tend to produce positive, though usually slight, correlations between the astrenic traits of self-expression (the median $r=+.23$). Whatever the cause, the intercorrelations are not sufficiently high to justify the surrender of the concept of traits. A trait, of course, does not spring into existence the minute it is named, but it *can* be established, laboriously, on the principle of internal consistency. That the neurotic make-up is an inclusive trait cannot be denied from the Thurstones' work; it is, however, the argument of this note that the total score on their Personality Schedule gives only the crude frame-work of personality, and that other less general traits must be established to fill in the detail.

Table 2 is added to this note for its general interest and possible value to investigators who wish to have norms for the inventory. The rather

TABLE 2
THURSTONES' NEUROTIC INVENTORY
Interval Distribution of Scores in Percentages

Scores	Chicago male freshmen (387)	Dartmouth male sopho- mores (few juniors) (200)
0- 4	2.1	
5- 9	4.7	4
10- 14	5.2	4
15- 19	10.3	6
20- 24	11.1	11
25- 29	10.3	11
30- 34	13.2	9.5
35- 39	6.1	5
40- 44	5.9	11
45- 49	5.2	6
50- 54	5.9	8
55- 59	5.9	5.5
60- 64	2.8	4
65- 69	1.8	4.5
70- 74	2.1	3
75- 79	1.6	1.5
80- 84	2.1	2
85- 89	.8	1
90- 94	.8	1
95- 99	.8	1
100-104	.5	
105-109		.5
110-114		
115-119		.5
120-124	.5	
125-129		
130-134		
135-139	.5	
	100.0	100.0

Quartiles

	Chicago freshmen (approximate)	Dartmouth
Least neurotic quartile	0-20	0-24
Next neurotic quartile	21-32	25-39
Next neurotic quartile	33-53	40-54
Most neurotic quartile	54-up	55-up
Mean	37.32*	41.14*
Median	32 (?)	39

*Difference between means = 3.82.

P.E. = 1.287.

diff.

Difference = 2.19 *P.E.*

diff.

The following are the situations ranked, in order of their average rank, i.e., of the degree of emotional maturity involved according to the pooled opinion of the judges. The original source of the situation or statement and the median rank (to the nearest interger) are noted in each case:

1. Noguchi gives orders for the inoculation of monkeys with serum from his own body, a day or so before his death from West Coast fever. [News report.] (2)

2. "Think of a man who could write observations on his approaching death and then go off to coast afterwards! It's what life can and should be. It's the difference between life and self." [Christina in *The Silver Cord*.] (3)

3. A Jesuit, upon leaving his office for the last time to enter a hospital for treatment for an incurable disease, paused in a matter-of-fact way for a moment to remove his card from the door, immediately resuming his conversation with a friend as if nothing had happened. [Biography of the subject.] (4)

4. "There, the stars *are*. Words are only symbols; put the stars in words and you merely say what they are like. But in Timbuctoo, what the stars are you feel with every sense. And it is all ineffable because the mind simply cannot grasp it and say that it is *like* anything; because, with every sense played upon, you cease at last to be a point of view. You, also, *are*." [Hall, *Timbuctoo*.] (4)

5. A psychologist remarks that he apprehends Millikan's work on cosmic rays and atom-building as having important religious significance. [Personal conversation.] (5)

6. "I'm quite cold on the whole subject of religion—it's not that I'm hostile, but I simply can't get up any enthusiasm." [Personal conversation.] (5)

7. "You'll see that it all comes straight somehow and turns out for the best. Life takes care of such things. All we have to do is to keep out of life's way and make the best of things as *healthily* as possible." [Christina in *The Silver Cord*.] (6)

8. "Thy ways are too wonderful for me." [Book of Job.] (8)

9. "Immortality doesn't seem very real to you; but my mother is just as much with me as she ever was in her lifetime." [Personal conversation.] (10)

10. "Into Thy hands I commend my spirit." [New Testament.] (10)

11. Upon inquiry by a friend as to what economic provision had been made for the next year, the subject replied "I don't know—the Lord will provide." [Personal conversation.] (13)

12. "If there were a good God He wouldn't let...[local calamities]...happen." [Personal conversation.] (14)

13. "I told him I could not decide whether to go to Mauretania or down the Niger. 'When one of us is in doubt,' he said, 'He goes to consult a holy man.'" [Hall, *Timbuctoo*.] (15)

14. "'I walked into the market place,' he said, 'And read in a loud voice from the Bible. I read in our English tongue, and no one understood what I read; but for the first time the Gospel rang clear in the heart of that ancient, wicked city.'" [Hall, *Timbuctoo*.] (15)

15. "Each, when he was sure of not being ridiculed, would take from the leather wallet hung about his neck a parchment folded small, frayed and dirty along the folds, too; and would discover to

me the Arabic texts written thereon by the holy man who had blessed him before he went north into the lands of the Christians. Beside the miracle of those texts all the white man's civilization faded to insignificance." [Hall, *Timbuctoo*.] (15)

16. "What's God for if not to give us *some* help in our troubles?" [Personal conversation.] (16)

17. "'And you must remember what David, in his blindness, has forgotten. That mother love suffereth long and is kind; envieth not, is not puffed up, is not easily provoked; beareth all things; believeth all things; hopeth all things; endureth all things.... At least, I think *my* love does.'" [Mrs. Phelps in *The Silver Cord*.] (16)

18. "'Only to one with a profoundly religious point of view.... and, if there's one thing I pride myself on it *is* my profoundly religious point of view.... I always keep the *Little Flowers* on the table beside my bed. And read *in* them, you know. I quite brought Robin up on them. Dave never took to them.'" [Mrs. Phelps in *The Silver Cord*.] (16)

19. "The meetings were held night and day, and carried on with great energy and zeal. No doubt speakers and hearers thought themselves honest and right; they certainly were earnest and zealous. They would travel miles to attend the meetings; rain or sunshine made no difference. Men would start on the run from their fields, without coat, hat or shoes, warning all they met on the way to go with them; excitement would beget excitement, and soon a crowd would be raised." [McLellan, *History of Gorham*.] (18)

20. "Mr. D. is something of a scientist too, and in your own field; while you try to find out how people can best profit themselves here, he is trying to learn how they can best profit hereafter." [Conversation of the wife of a fundamentalist lay preacher with a scientist.] (18)

21. "These men forgot God." [Diagnosis of a New Jersey governor on some convicted murderers.] (19)

22. The Blasphemy Act of the Commonwealth of Massachusetts. (20)

23. "Exhortations of the most exciting nature, singing, dancing and whirling, became a part of the services. All who did not join were vehemently denounced by name, called anti-Christ, devils and children of the devil. Some thought the vengeance of God would visit them if they even held communication with any of this wicked race." [McLellan, *History of Gorham*.] (20)

24. Men were convicted and fined in Massachusetts in 1929 for "being present at a game on the Lord's Day." [News report.] (20)

25. "Shall we be taxed to damn our children?" [Slogan of the Tennessee fundamentalists.] (21)

The following is the order of variability, in terms of the number of ranks between that containing the third and that containing the tenth judgment, i.e., approximately the interquartile range; this number is given in parentheses:

Noguchi gives orders.... [No. 1] (2)

Atom-building.... [No. 5] (2)

A Jesuit.... [No. 3] (3)

- "You'll see that it all comes straight...." [No. 7] (3)
 Book of Job.... [No. 8] (3)
 "There, the stars *are*...." [No. 4] (4)
 "Shall we be taxed...." [No. 25] (4)
 "Think of a man...." [No. 2] (5)
 "Immortality...." [No. 9] (5)
 "Only to one with a profoundly religious...." [No. 18] (5)
 "'I walked into the market place,'...." [No. 14] (6)
 Massachusetts Blasphemy Act. [No. 22] (6)
 "Exhortations of the most exciting nature...." [No. 23] (6)
 "I'm quite cold on religion...." [No. 6] (7)
 "Each would take from the leather wallet...." [No. 15] (7)
 "Being present at a game on the Lord's Day...." [No. 24] (7)
 "Into Thy Hands I commend my spirit." [No. 10] (8)
 "The Lord will provide." [No. 11] (8)
 "How they can best profit hereafter...." [No. 20] (8)
 "A good God wouldn't let....happen." [No. 12] (9)
 "In doubt we consult a holy man." [No. 13] (9)
 "The meetings were held day and night...." [No. 19] (9)
 "These men forgot God." [No. 21] (9)
 "What's God for...." [No. 16] (13)
 "Mother love suffereth long and is kind...." [No. 17] (14)

There is a certain tendency for the variabilities to be large in the middle of the scale (that is, in the region where the median rankings are about 10-15) and to diminish toward both ends. This is no doubt partly an artifact, due to the prohibition of judgments above a rank of 1 or below a rank of 25; however, it probably also reflects the condition that the judges feel more certainty in recognizing a very mature or a very immature attitude than they do in assigning a rank to one of intermediate maturity. It is probable that the last two situations (Nos. 16 and 17 in the first list), since their variabilities are more than half the scale, are so ambiguous that their median ranks are without much meaning; this is puzzling in the case of No. 16, but in that of No. 17 appears to be due to the fact that enough of the context cannot be given in a short space to give the judge adequate background for judging the lady's maturity.

There were seven deviations greater than 10 ranks; they were as follows:

Jv, a professor of psychology, has a positive deviation (that is, he places it lower than the average judgment places it) of 16 ranks on No. 7 of the above list, and a positive deviation of 15 ranks on No. 10.

S, a psychological secretary, has a positive deviation of 16 ranks on No. 6.

G, a graduate student, has a positive deviation of 14 ranks on No. 9, and a negative deviation of 13 ranks on No. 19.

Wm, the wife of a psychologist, has a negative deviation of 14 ranks on No. 14.

C, a graduate student, has a positive deviation of 11 ranks on No. 9.

No. 9, the only one to be duplicated in this list, is clearly difficult to evaluate; the negative deviation on No. 19 is curious, as is the positive

deviation on No. 10; but the others are understandable. Of the judges making these extreme deviations, S and C are conspicuously well-adjusted, the others less so; religion does not seem to play a marked part in the life of any.

These results seem of some interest to the writer as shedding light on the attitude of the type of person who is commonly thought of as non-religious, who is rather highly sophisticated regarding empirical human nature, and who by reason of training or natural predisposition finds himself committed to a naturalistic view of the world and of the phenomena of mind. To such persons the order of phenomena commonly thought of as religious, and crystallized in law and customs, appear as simply evidences of infantilism and profound psychic arrest of development; while phenomena regarded by them as significant of emotional adulthood are of an order of freedom from ego-concentration, and of cosmic and human identification, as yet wholly incomprehensible to the ordinary communicant or even to the great bulk of his ecclesiastical leaders.

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UTILIZING OPINION FOR CHARACTER MEASUREMENT

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The modern scientific thinker, laboring as he does with weighed and measured facts and observations, is apt to dismiss the use of opinion in any realm of scientific effort as being devoid of practical worth. "Give me facts and don't bother me with opinions," is a familiar expression.

Yet in the field of character research, in which any overt expression of the individual may reveal inner measurable values, it appears that opinions are in themselves facts and for certain purposes highly significant. Since opinions form such a considerable part of spontaneous individual expression, the ease with which "opinion" data are obtained marks opinion as a convenient and fruitful source of material for the worker in character measurement, while the successful use of such data waits chiefly on the discovery of methods for significantly treating it.

As factual data, opinions may be considered as throwing light in either of two directions, (*a*) upon the object of the opinion, or (*b*) back upon the holder of the opinion; and it is in this latter function, that of evaluating the subject rather than the object of the opinion, that the study herein described utilizes opinion. That is to say, a man's opinion about prohibition, international affairs, married life, etc., while of no great value in settling any of these particular problems, may be very useful in telling us whether the man himself is radical or conservative, social or unsocial,

pessimistic or optimistic, enthusiastic or otherwise. This might well be termed a retroactive method of character measurement.¹

For several months the writer has been experimenting with an "opinion" technique as a means of measuring various characteristics, having originally in mind the trait of conservatism.² This technique consists simply of presenting the subject with a number of controversial statements to which he is asked to indicate his agreement or disagreement by making a plus or minus sign before each statement. Since the original purpose was to measure radicalism and conservatism, statements were chosen which would involve this characteristic.³ The statements used are drawn from various fields of interest: ethics, education, feminism, freedom of speech, international affairs, sex and marriage, politics, race relations, religion, sport, transportation, mechanics, etc. Samples follow.

Historic heroes should not be "debunked."

The wisest people usually conform most closely to social conventions.

Companionate marriage should be discouraged.

Any attempt to control the breeding of humans is vulgar and out of place.

If the Supreme Court finds a law unconstitutional, its decision should be accepted as final by the people.

Dancing is more of a sin than failure to support one's church.

The ballot should not be extended below the age of 21.

Unemployment is inevitable as long as we have so many inefficient and shiftless people.

The American Churches were right in supporting the last war.

Cat meat is out of the question as an article of human diet.

Religion will some day be as scientific as chemistry, physics, astronomy, etc.

Science should endeavor to discover a harmless liquor retaining most all the good features, but lacking the harmful features of alcoholic beverages.

In the interest of developing cooperation, term papers should be worked up by committees rather than by each student for himself.

Adolescent children (14-21) should be stimulated to make unbiased study of all religions (including non-religions) for the purpose of selecting fearlessly and intelligently the best religion, or best parts from each.

We should severely punish delinquents upon the first offense and thus prevent most second offenses.

An ideal college student would be one who roots for the opposing team as much as for his own team.

A thorough-going political union of the United States of America and Great Britain under a system of government which would incorporate the best points of both present governments, would be highly desirable.

¹This general method is well illustrated in Watson's study of fair-mindedness (6), and with more contrast in the studies of Allport (1) and Thurstone (5) which are concerned with the measurement of specific opinions each on its own account.

²The writer wishes to acknowledge special indebtedness to Miss Marguerite Bickel for valuable assistance in the development of this technique, she having done a large part of the work in the first attempt to experimentally evaluate the theory.

³The preliminary technique is identical mechanically with that described by Harper (3).

The U. S. Congress should appropriate as much money every year to prevent war as they appropriate to prepare for war.

We should Europeanize our native Americans as well as Americanize Europeans among us.

Our higher institutions of learning should provide more favorable places and opportunities for love-making.

(In actual practice the items are listed at random.)

The scoring technique consists in giving one point credit for conservatism each time the subject agrees with a conservative statement or disagrees with a radical one. For instance, the scoring key for the first 10 statements listed above is minus, and for the second 10, plus: that is, agreement with the first 10 and disagreement with the last 10 gives 20 points for conservatism. In making the key all statements were first marked as "C"onservative or "R"adical. Using as a working definition of conservatism, "opposition to change," or conversely for radicalism, "belief in or expectation of change," the several judges showed very little disagreement among themselves as to which statements were radical and which were conservative. Their "C"s and "R"s were automatically changed into minuses and pluses to form the key.

The data here reported relate to college and university students. Taking all groups together we find a very satisfactory spread of scores ranging from 10 to 105. The reliability coefficients secured are shown in Table 1.

Reliability coefficients for sub-groups range from .71 to .95, all on the basis of the split-half, Spearman-Brown procedure.

TABLE 1
RELIABILITY COEFFICIENTS

Form	Student groups	Number of cases	Reliability coefficients
A	Freshman, sophomore, and senior students, engineering and education	112	.87±.015
B	Sophomore, junior and senior students, psychology	94	.73±.033
C	Freshman, sophomore, junior and senior students, psychology and education	120	.78±.024

TABLE 2
CORRELATION BETWEEN CONSERVATISM SCORES AND SCORES ON THE OTIS INTELLIGENCE TEST

Group	Form	Number of cases	r
Freshmen	A	22	.12
Upper classmen	A	15	— .17
Sophomores	A	30	— .10
Upper classmen	A	39	— .08
Group III	C	48	.06

As negative evidence on validity, conservatism scores were correlated with scores on the Otis Intelligence Test with the results shown in Table 2.

These figures imply that, whatever the test measures, it does not measure intelligence.

For further inquiry into the meaning of the test and its validity for general conservatism, the elements of the entire test were divided into halves on the basis of the fields of interest from which the elements were originally made up and not on the chance basis as in the case of the previous operation when reliability coefficients were derived. That is to say, all elements bearing on economics and politics, etc., were placed in one half and those bearing on religion and education, etc., were placed in the other half. The correlation between the two halves when split thus appears practically as great as on the chance-split basis. This procedure was employed to test the soundness of the reaction of mature subjects who contend that they are radical in some things and conservative in others. While more data are desirable on this point, present indications are that conservatism for certain purposes and to a certain degree can be considered a general trait.

A further question under validity relates to the "fakeability" of the test, which further rests upon the question of "visibility." Do the subjects know they are being tested for conservatism? It has been the writer's practice, when giving the test to his own classes, to call for guesses from the students at the close of the hour as to the probable purpose of the test. With one exception, out of more than a hundred cases including students in measurement classes, no one has guessed the purpose of the test.

In summary, the experimental data indicate that we have a test which on the surface appears to measure conservatism, showing reliability coefficients indicating that we are measuring with appreciable accuracy something not correlated with intelligence.

Experimentation to date has included the tryout of about five hundred elements in the three forms, A, B, and C, the purpose being to build up one or two more reliable forms consisting of the best elements chosen from the total number tried out. This work is at present complicated and retarded by statistical difficulties encountered in the evaluation of the various elements. The reliability of the evaluation secured by any one method, while appreciable, is unsatisfactorily low. Moreover, there appears a marked disagreement between the evaluations by two different methods applied to the same data. The present task is concerned with the evaluation of several methods of evaluating elements.

As suggested at the beginning of this article, we are interested in the utility of opinion as a means of measuring various aspects of personality. In this connection five other traits have been suggested as being measurable by this same test, originally constructed for the measurement of conservatism. These traits may be referred to as:

Acquiescence or suggestibility
 Variability or constancy
 Compatibility or like-mindedness
 Atypicality or independence of thought.
 Social insight

Acquiescence. The score for this trait is simply the number of plus reactions. Form C of the Conservatism test consists of 75 radical and 75 conservative statements. A person perfectly radical should have on his paper 75 pluses and 75 minuses; likewise a person perfectly conservative. In general and on the average, regardless of one's degree of conservatism, one should have 75 pluses on his paper unless he is either positively or negatively suggestible. Allowing for the factor of chance, a person who has more than 75 pluses should be considered a "yes" person and positively suggestible, and one who has less than 75 pluses, a "no" person, negatively suggestible.

Statistical data (for Form C) are shown in Table 3.

TABLE 3
 STATISTICAL DATA FOR ACQUIESCENCE

	Number of cases	Group	<i>r</i>
Reliability (odds-evens, Spearman-Brown)	82	I	.73±.035
Acquiescence and intelligence (Otis S-A)	47	III	.06±.09
Acquiescence and conservatism	82	I	— .13±.08
Acquiescence and conservatism	48	II	— .07±.09
Acquiescence and conservatism	47	III	.06±.09
Range of score for the 82 cases—63-113.			
Median score—79.			

These last three correlation coefficients are contrary to Harper's finding that conservatives are more acquiescent or tend to agree more than radicals, but we believe Harper's deduction mathematically spurious due to the unbalance of his measuring instrument. Nearly two-thirds of his statements are conservatively stated, consequently the more conservative the subject, the greater the number of agreements or pluses; and, conversely, the more acquiescent the subject, the more likely he is to agree and receive conservative credit. Our contradictions are at least suggestive of the fallibility of our instruments of measurement.

Variability. By this term we mean the tendency of the subject to make different reactions to the same questions upon a second presentation. For this we have data on only 50 Summer School students at Washington University. Form C of the Conservatism test was presented the second time after an interval of four days. The range of variability score is from 3 to 33. The reliability coefficient (odds and evens, Spearman-Brown procedure) is .80. Since variability as here manifested is a function both of the subjects and of the items of the test, it seems apparent that some items

are far more suitable for this purpose than others and that a test arranged specifically for this purpose could be much more efficient than the one we have used.

Compatibility. By this term we mean the degree of agreement between the opinions of any two individuals to be secured simply by using one person's paper as a key for scoring the other. This should be interesting as applied to friends, husband and wife, relatives, etc. Thus far there appears on only 27 married couples a reliability coefficient of .92. The range of scores is from 84 to 132, all on Form C of 150 items. If we assume 75 agreements by chance we might consider the range of compatibility to be from nine seventy-fifths or 12% to fifty-seven seventy-fifths or 76%. Further data are being collected which we hope to report as soon as available.

Atypicality. By this we mean the tendency of persons to be in the minority. The atypicality score is obtained as follows: if a student agrees with a particular statement and nine-tenths of all college students tested disagree with it, the subject is given nine points for "atypicality." In other words he gets as much credit for atypicality as there are deciles of the general student population who disagree with him. The reliability coefficient on 35 cases for atypicality is .46. The correlation of atypicality score and deviation from median on conservatism, 35 cases, is $.50 \pm .08$.

Social Insight. While no experimental evidence or data have been obtained upon this feature, the suggestion is as follows: out of several hundred or thousand college students, find the percentage who agree to each of the various statements listed. These data may then be used as a key for scoring the reaction of further subjects, under the following instructions: "Place by each statement the percentage of college students whom you suppose would agree with this statement when confronted by it in a formal test situation." On each element the subject would be given the amount of credit indicated by his ability to guess somewhat nearly the actual percentage found by the survey. The formula might be as follows: Insight score equals the summation (100 minus the difference between actual percentage and guessed percentage on each element). Such a score might have bearing in measuring one aspect of fitness of a faculty member to instruct college youth.

As indicated above, the tentative forms of the test were formulated in the interest of measuring conservatism and radicalism. If we are to measure most successfully these other traits by the technique of "opinion," we will probably need to arrange a different set of statements for each of the traits. For instance, in relation to compatibility, the agreement and disagreement of opinion between husband and wife would be much more important on some questions than on others. Extended research could determine those opinions most pertinent to connubial or "friendship" harmony. Likewise, for the measurement of acquiescence or suggestibility, one would utilize well-balanced questions. We may find other traits meas-

urable by the same technique, utilizing different opinions or statements, such traits as optimism or pessimism, cynicism, social-mindedness, etc.

Research in developing as well as in using such tests would seem to constitute a most suitable project for the collaboration of the psychologist with the sociologist,⁴ as the latter would be greatly interested in the specific opinions and the percentage of various groups agreeing and disagreeing. For instance, are there differences in the opinions of present and future voters? What are the chief shifts in opinion from ages 18 to 25, 25 to 35, 35 to 60, etc.? How much does the college student share political, economic, and religious opinions with his parents⁵ or with his college instructors? What are other sources of opinion? What shifts in average opinion are taking place in any one year? This technique, while designed to measure individual character by way of opinion, can at the same operation be useful in measuring opinion in social groups.

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NOTES ON THE CONSTRUCTION OF MENTAL TESTS FOR AMERICAN INDIANS¹

FORREST CLEMENTS

The question of innate racial differences in general intelligence continues to perplex psychologists and anthropologists. Tests have been applied to different national and racial groups but the evidence so accumulated is conflicting and the difficulty of controlling variables other than

⁴Excellent illustrations of the social side of such measurements are found in the works of Harper (3), Katz (4), and Betts (2).

⁵A study is under way which deals with the comparison in several respects of opinion reactions, on Form C, of university students and their parents.

¹The work contained in this report was done while the author was a National Research Council Fellow under the sponsorship of Dr. Clark Wissler. The field study was made in the autumn of 1928.

innate differences is so great that the question seems almost as far from an answer as ever.

In many cases the tests which have been applied to primitive peoples or other non-Caucasians have been either identical with or but slightly modified versions of tests designed for use upon persons born and reared in the general Western European-American type of culture. Obviously, when such tests are applied to a people whose customs and institutions differ markedly from the cultural matrix in which the test was devised, the results obtained are not much more than a demonstration of this difference.

On the other hand, tests specifically devised for a particular culture pattern, if properly constructed and validated, would furnish a means of measuring relative intelligence there and could be used in a variety of problems involving individual intellectual differences within the group living in that culture. Although this method does not offer a direct approach to the problem of innate racial differences in intelligence, it will afford material for a comparative study if the procedure is applied to a number of different groups.

As such an approach seemed to possess interesting possibilities, a visit was made to the Indian pueblo of Zuni, New Mexico, for the purpose of making a preliminary survey as to the feasibility of constructing and applying mental tests based on the Zuni culture pattern. This location was selected on account of the relatively large population of the pueblo and the persistence of the native culture forms. Also, it is likely that tests devised for this people could be applied with very little change to all the pueblo Indians.

As the resumption of the work seems doubtful, the conclusions reached by this survey are set forth here not only because they may prove of general interest but also in the hope that they may prove helpful to others engaged in similar work. These conclusions deal mainly with points either not stressed or overlooked in most applications of mental tests to primitive people. They involve the question of familiarity with the subject-matter of test items and the very important necessity of providing incentives to react to fullest capacity.

It is self-evident that no one should plan to devise a test based on an aboriginal culture without thoroughly acquainting himself with that culture. Ethnological reports furnish much concrete information, but there is nothing that can take the place of actually living with the people and participating in their culture. Only in this way can insight into their habits of thought and action be gained, and it will be found that such insight is very necessary in order to frame a proper test.

The matter of language difference is perplexing but not incapable of solution. Non-language tests may be devised, but, as with any other type, the experimenter must guard against the inclusion of elements which are common and "natural" in the culture matrix within which he himself has

lived but which may be strange or lacking in the culture of the people with whom he is dealing. In giving non-language tests the necessary pantomime will have to be carefully built up with an eye to this point. However, it will be more satisfactory for the examiner to gain some knowledge of the native language and to include in his tests as many verbal elements as practicable along with performance items.

Group tests are quite undesirable when dealing with Indians for the reason that proper assemblages for the giving of such tests are difficult to secure. Indians are much less accustomed to acting in groups than are white persons, especially when a formal exercise of this nature is to be done. In such a situation the individual consciousness of racial and cultural difference with the examiner is intensified. Furthermore, the tendency on the part of testees not to react to their fullest capacity is harder to overcome in groups than in individuals. These factors undoubtedly have a detrimental effect on performance and mitigate against the use of group tests.

The best form of test for this work would be a series of individual tests conceived in the general manner of the Binet and embodying both verbal and performance elements. The series should range from easy to difficult items, but copious standardization is not necessary. In giving such tests the examiner has greater control over each subject, and it is easier to establish the proper attitude between testees and tester.

Although no attempt was made to contrive any formal tests during the stay at Zuni, simple puzzles, conundrums, arithmetical problems, and other such devices were tried on a considerable number of adult natives. The object was to observe their responses to problems or situations which might be considered analogous to test items.

*Arithmetical Problems.*² If such problems are stated concretely and in familiar terms the subject will endeavor to solve them, although the response is more casual than is usually the case with a white person. Abstractly stated problems leave the subject in doubt as to what is wanted, and a lack of interest with a corresponding decrease in effort follows. There is little curiosity or attempt to clarify the problem. For interest and effort to be displayed the problem must have an obvious practical application in the native culture and be stated in familiar terms.

*Conundrums and Riddles.*³ These devices seem to mean absolutely nothing to the Zuni and arouse no interest. The lack of interest would

²These problems embraced addition, subtraction, and division. Only the simplest of fractions were involved and these only in problems of division. In this way the necessity for knowledge of formal arithmetical devices was minimized.

³The riddles used were simple and involved such common things as the sun, rain, lightning, human beings, etc. Example: "What animal goes on all fours when it is young, two legs when grown, and three when old?" Ans.—Man.

probably be found among all American Indians, as riddles were entirely foreign to American aboriginal culture. They have not been taken over to any extent by present-day Indians and the unsuitability of analogous problems as test items is evident.

*Verbally Stated Puzzles.*⁴ The reaction toward these is very much like that toward riddles. Even when the first puzzle is solved for the subject he takes no more interest in the second than in the first. Here again we are dealing with something foreign to the native culture and the necessary thought-pattern is lacking. An exception must be made with those puzzles which are really exercises in arithmetic. If these are stated in familiar terms and made pertinent to some phase of the local routine they always arouse interest and an attempt at solution.

*Mechanical Puzzles.*⁵ Much more interest and effort are inspired by simple mechanical puzzles, folded paper cut to form a pattern when unfolded, and similar contrivances than by verbal puzzles. When given to several persons in a small group they engender a mild competitive spirit which furnishes an incentive to respond to fullest capacity. It is likely that the manipulative possibilities of the mechanical puzzle cause it to arouse interest easily.

⁴Examples "A man has a fox, a turkey, and a bowl of corn. He wants to cross a river. There is a boat but he can only take one thing at a time with him in the boat. If he takes the corn and leaves the fox with the turkey, the fox will kill the turkey. If he takes the fox, the turkey will eat the corn while he is gone. How does he get all three across the river without harm coming to any of them?"

"Long ago when white men and Indians fought each other, three white men and three Indians came to a river which they had to cross. A boat was there, but it would only hold two men at one time. Only one white man and one Indian knew how to row, but it was only necessary for the boat to contain one rower for a trip across. If there were ever more Indians than white men together, the Indians would kill the white men. How did they all get across the river without trouble?" (In this problem marked sticks may stand for the men and a line on the ground for a river).

Example of arithmetical puzzles: "A woman has three pots. One holds two gallons, one holds five gallons, and one holds seven gallons. She takes all three down to the river and uses only these three pots to measure with. How can she get exactly one gallon of water in one of the pots?"

⁵Examples: *Chain puzzle*: the subject is given two metal links so hooked together that they will only separate when held in a particular position with relation to each other. He is asked to separate and rehook them.

Pentagon puzzle: the subject is given five cardboard triangles and shown the outline figure of a pentagon. The task is to fit the triangles together to form a pentagon like the figure shown.

Paper-cutting: a piece of paper is folded twice and cut across the corner of the fold. It is unfolded and the subject shown that it has one hole in it. Another paper is folded three times and cut across the corner of the folded edge. When unfolded it has two holes. A third paper is folded four times and cut as before. Unfolded it has four holes. Another paper is folded five times and cut across the corner. The subject is asked how many holes it will contain when unfolded.

*Detection of Absurdities in Absurd Statements.*⁶ If problems of this type are given a local setting they attract interest once the essential point is grasped. Analogous items in a test series should prove satisfactory if the situations are made familiar.

The above observations indicate that lack of interest and lack of incentive to respond to fullest capacity are the main obstacles to be overcome in the construction of test items. It is obvious that unless an item stimulates a subject to react to his fullest capacity that item is worthless in a test. Conclusions based on test results where the subjects have not fully responded are sure to be misleading and may be doubly so in work of the sort under discussion here. Incentives which are adequate to provoke a full response with the persons reared in our own culture may often fail completely with Indians. It is of the first importance to seek out the common incentives which move the people with whom the work is being done and to frame test items in such a way that these incentives will operate. Likewise, test items must arouse interest. These items can only be determined empirically, but the most suitable will be those containing familiar elements and having some bearing on the daily life of the people.

Although the construction of an adequate series of individual mental tests for adults seems feasible, there are difficulties other than those previously mentioned. Lack of control of the subject is one of the most obvious. Another is the impracticability of securing an adequate number of subjects without payment of a fee to each one.

These difficulties would be greater during the preliminary construction and testing of the series than in giving the completed tests. For these reasons it would probably be better to utilize the Indian children in the government schools for the initial period of test construction and validation. In this way there is no necessity for paying subjects to take the tests, and the examiner exercises greater control. The language difficulty is minimized as no language but English is permitted in the schools and all children beyond the second year in school understand it fairly well. Also, the school atmosphere, the student-to-teacher attitude, is very helpful in establishing proper relations between the examiner and the subjects. Furthermore, once a reliable series of tests has been worked out for school children, it can be extended to include adults with much less difficulty and expense than will be the case if adults only are used in the initial work of construction. It is understood, of course, that this applies specifically only to communities where the aboriginal culture is fairly well preserved as is the case with the pueblo Indians. The children used in the test construction are to be living at home and merely attending a day or mission school located on the reservation. Children in distant boarding schools,

⁶Example: "The road from here to town is downhill all the way to town and downhill all the way back." What is wrong with the statement?

especially after several years of attendance, are out of touch with their natal culture.

Much of the recent work on native Indian intelligence has been done on these boarding-school children for the reason that they are easily accessible and the language difficulty is greatly reduced. However, there is need for considerable caution in the interpretation of test results so obtained. Although these children have been subjected to a school curriculum much like that of white children, it does not follow that their total background is comparable to that of children reared as well as schooled in white culture. Indeed, it may be safely asserted that the differences are considerable. In many such schools the children are drawn from a large area embracing different tribal cultures. Marked cultural differences thus exist among the children of these schools. For these reasons standard tests commonly used with white children are inapplicable to these Indian children, as well as tests especially framed for a given cultural group. Moreover, due to the different cultures represented among such children, they are unsuitable for use in the construction of tests aimed to fit any one culture pattern. On the other hand, children residing at home and attending a day school on the reservation represent only the local culture and are living in it. At the same time their school attendance minimizes their language handicap and renders them easily available for testing. In work of the sort discussed here the superiority of these latter children over those in most boarding schools is obvious.

SUMMARY OF CONCLUSIONS

Group tests are impracticable for either children or adults among the pueblo Indians and probably all American Indians.

Individual tests whose items consist of both verbal and performance elements are the most suitable.

Adults should not be used in the initial construction and testing of the series. The main factors mitigating against their employment are: (*a*) lack of control of the subject by the examiner, (*b*) difficulty of securing any number of subjects without paying each one a fee, and (*c*) greater language difficulty.

Indian children in the day or mission schools and living on the reservation afford the best material for the initial construction and validation of a series of individual mental tests based on the culture in which they live.

Once a reliable series of tests is devised for children it can be extended to include adults.

Test items should consist of elements familiar to the subjects and should possess easily seen relations to the daily life.

The common incentives native to the culture should be used as incentives to test response. Incentives which operate satisfactorily to cause complete reaction among white testees often have no meaning to the Indian.

Indian children in large boarding schools are probably unsuited for most types of mental testing on account of the marked heterogeneity of cultural background.

The comparatively small number of persons available for testing in any one American tribal culture may make it impossible ever adequately to validate and test a series constructed solely for any one of them. On the other hand, such cultures are isolated and their single ethnic units are relatively small. It is thus likely that such cultures operate with much more equal force on each individual than is the case in more complex cultures. This makes for homogeneity of cultural background and a representative sample of the population would probably not need to include as large a number of cases in proportion to the total as is necessary in work on the white population.

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WILLIAM JAMES LECTURE

By a gift of the late Edgar Pierce, Ph.D. Harvard 1895, and author of "The Philosophy of Character," a Lectureship in honor of William James has been established in Harvard University. Dr. Pierce was at one time Instructor in Psychology at Harvard, and later a member of the Visiting Committee for the Department of Philosophy and Psychology. Appointments will be made to this Lectureship at least biennially, the appointees being in residence at the University and participating in the regular instruction. Professor John Dewey will be the first lecturer on this foundation. During the spring term beginning February, 1931, he will deliver a series of ten public addresses on a topic not yet announced. The subjects covered in the William James Lectures are not limited in any way, beyond the general condition that they must fall within the field of philosophy and psychology. The lectures will appear in book form.

BOOKS

LYND, R. S., & MERRELL, H. *Middletown, a Study in Contemporary American Culture*. New York: Harcourt, Brace, 1929. Pp. 550. \$5.00.

MEAD, M. *Coming of Age in Samoa*. New York: Morrow, 1928. Pp. 297. \$3.00.

HOLLINGWORTH, L. S. *The Psychology of the Adolescent*. New York: Appleton, 1928. Pp. 227. \$2.50.

CHADWICK, M. *Difficulties of Child Development*. New York: Day, 1928. Pp. 411. \$4.00.

JOHNSON, HARRIET M. *Children in the Nursery School*. New York: Day, 1928. Pp. 325. \$3.00.

GESELL, A. *Infancy and Human Growth*. New York: Macmillan, 1928. Pp. 418. \$3.50.

The arrangement of the books listed is not a fortuitous one, nor are the subjects, varied as they appear, without relation to one another. They may be regarded as ranging from the general to the particular in descending order, that is, *Middletown* delineates the social life of a community, the next two books deal with the problems of adolescence, namely, with one level or segment of community life, the following two are concerned with the younger child, and the last with the earliest stages of human life. There is thus a progressive narrowing of the scope of investigation and at the same time a pushing back from one level to that one which precedes it in a temporal sense.

While the material is thus progressively delimited, the methods employed show instances of striking similarity. Such, for instance, is the use of what we are accustomed to call the "longitudinal" method of social and psychological investigation. Gesell's earlier work has familiarized us with his use of this method, which is, indeed, one of the most distinctive contributions to child study. The direct comparison of children at different age levels, for example, of the three-month with the six-month infant, as well as the comparison of the same child with his earlier records by means of repeated examinations are two phases of the longitudinal method which he has developed. It is interesting to find the writers of *Middletown* utilizing the same method in order to study the social life of an American city. They state their intention thus in the introduction to *Middletown*:

"The further device has therefore been adopted in this investigation, wherever the data available permitted, of using as a groundwork for the observed behavior of today, the reconstructed and in so far as possible equally objectively observed behavior of 1890. The year 1890 was selected as the base-line against which to project the culture of today because of greater availability of data from that year onward, and because not till the end of 1886 was natural gas struck in the city under study and the boom begun

which was to transform the placid county-seat during the nineties into a manufacturing city."

Middletown, p. 5

That is, just as Gesell compares the infant of today with what he was three months ago, or as Miss Johnson points out the differences in social or motor development between the two- and the three-year-old, so throughout this book the Middletown of today is consistently set beside the Middletown of thirty-five years before, in order to measure differences. The possibilities of the longitudinal method in the fields of practical psychology are only beginning to be explored, but this latest attempt to carry the method over into the field of sociology is one of the most significant demonstrations of its effectiveness.

It is a necessary consequence of the use of this method that the concept of "growth" looms large with those who employ it. This is, of course, explicit in all Gesell's work—in *Infancy and Human Growth* the first chapter is devoted to a theoretical discussion of the place of the concept of growth in the biological sciences, and in particular to the concepts of mental growth. In Miss Johnson's work growth is an equally fundamental idea, but here the practical question is uppermost: "How shall we supply the conditions most favorable to the growth, physical, mental and social, of the young child?" So insistent is this emphasis that *Education for Growth* might well be the subtitle of her book.

Further, when we deal with levels of social organization, the idea of growth is equally prominent. Societies, being self-perpetuating, do not show a life cycle comparable to that of the individual, at least, not unless one takes an extremely long-range view. It would be unwarranted at this stage of investigation to draw any conclusions about laws of social growth, certainly no one could be further from such indiscretion than the careful writers of *Middletown*, but there is one striking similarity between the growth of organisms and the growth of societies which can hardly fail to be remarked, that is the unequal rhythms of growth in different sections of society as in the different functioning systems which make up the individual organism. This inequality of growth of different functions seems to characterize life in all its phases, whether regarded on the physiological, psychological, or social level. Investigations into physical and mental growth have familiarized us with this idea of growth inequality, but its emergence in sociological studies has a somewhat novel aspect:

"Thus Middletown, due allowance being made for wide variations in practice within the city, may be observed to employ in the main the psychology of the last century in training its children in the home and the psychology of the current century in persuading its citizens to buy articles from its stores; it may be observed in its courts of law to be commencing to regard individuals as not entirely responsible for their acts, while in its institutional machinery for selling homes, failure to pay, whether due to unemployment, sickness, or other factors, is regarded as a deliberate violation of an

agreement voiding all right to consideration; a man may get his living by operating a twentieth century machine and at the same time hunt for a job under a *laissez-faire* individualism which dates back more than a century; a mother may accept community responsibility for the education of her children but not for the care of their health; she may be living in one era in the way she cleans her house or does her washing and in another in the care of her children or in her marital relations." *Middletown*, pp. 497-498.

Needless to say, a community whose coincident functions exhibit such striking anachronisms as the above is sociologically young; its life is one of precipitous change in all directions; at no one point has a stable equilibrium been achieved.

In contrast with a society where change is the outstanding feature, the social organization pictured in *Coming of Age in Samoa* is significant because of its static quality. The demands of the physical environment are not sufficiently exigent to compel growth; there occurs, accordingly, a case of arrested development, a low level of maturity beyond which the organization is incapable of advancing.

The formulation of precise laws of growth must, as Gesell says, wait on a multitude of experimental studies in diversified fields. How far the same laws will be found to hold at different levels of complexity is a question on which one can scarcely hazard a guess. The emphasis on the concept of growth in these varied studies has been cited merely to illustrate the wide range within which this concept is pertinent.

Having thus called attention to the longitudinal method and to the concept of growth as having special significance, especially for the extremes of this subject matter, it remains to discuss the books individually in some detail.

Middletown

It is neither possible nor desirable in a brief review to deal in detail with the organization and findings of this book. We are confining ourselves, therefore, to certain general impressions as to method and content. One outstanding result of this work is that its method demonstrates the effectiveness of starting at a complex level in an attempt at the analysis of human behavior. Even though this increases the difficulty of the initial problem it is serviceable in the long run as it supplies a general orientation, so that detailed studies are envisaged as a later development and in significant relation to the whole. If, on the other hand, the authors had begun with atomic parts, the individual investigations might have been highly satisfactory but their coordination into a unified view of the whole would probably have remained only an aspiration. This is the old difficulty of the Lockian psychology, a difficulty which recurs again and again in psychological work; how out of disparate parts to construct an organic whole. Too often at the present time the current emphasis on "fact-finding" is leading investigators into a great variety of isolated studies, often meticulously conducted but meaning little when they are completed because they

have never been envisaged as parts of a whole. When, on the other hand, one begins with the whole, the parts have always their meaning in relation to the larger scheme. Thus *Middletown* may be taken as the rough draft of a program of social investigation the details of which may be continuously explored, each step making more rich and definite the meaning of the whole.

The manner in which the writers of *Middletown* have carried through their task is shown in their unusual and refreshing ability to present familiar facts in a new light. It is easy, of course, for a civilized American to recognize the bizarre and strange in the customs of the Papuans, but to see our own fellow citizens—and ourselves—in a new guise is exceedingly difficult. Yet the obvious often takes on new significance when thus seen from a fresh angle. To quote only one or two short passages from a wealth of examples:

"As one prowls Middletown streets about six o'clock of a winter morning one notes two kinds of homes: the dark ones where people still sleep, and the ones with a light in the kitchen where adults of the household may be seen moving about, starting the business of the day." p. 53.

"The characteristic leisure-time pursuits of the city tend to be things done with others rather than by individuals alone; and except for the young, particularly the young males, they are largely passive, i.e., looking at or listening to something or talking or playing cards or riding in an auto; the leisure of virtually all women and of most of the men over thirty is mainly spent in sitting down." p. 226.

In addition to this pleasant trick of rubbing the tarnish off familiar facts, the authors have enriched the book with a wealth of illustrative detail—reports of speeches, sermons, newspaper reports, and many conversations with individuals who probably emerge from obscurity for the only time in their lives by reason of these records of their naïve comments. Thus, asked how they met difficulties—whether by religious consolations or in some other way—one woman replies:

"I just sit down and look facts in the face and try to see what can be done about them." p. 325.

"'I'd go without food before I'll give up the car,' said one woman emphatically, and several who were out of work were apparently making precisely this adjustment."

"'Lady,' exclaimed an earnest woman to one of the staff interviewers, 'you have asked me a lot of questions, and now I want to ask you some. Do you belong to the Klan?'"

And lastly the classic expression of group solidarity among the fraternal business class in Middletown:

"United we stick, divided we're stuck.
United we boost, divided we bust."

These seemingly trivial expressions show the stuff of which life is made;

they give vividness and concrete reality to the work as a whole, interpreted as they are by cautious and acute generalizations.

We have spoken of the use of the comparative method in this study; it is nowhere better applied than in setting the sayings of Dorothy Dix against those of Marion Harland. Readers of current tabloids will recognize the former as the final authority on questions of the family and the household, whereas Marion Harland played a similar rôle in the women's magazines of a generation ago. Nowhere are the changing standards of the present from those of a generation ago illustrated more poignantly.

When one turns from method to content what are the points emphasized as distinctive of the organization of this present-day community?

One striking feature is the acceleration in the process of change which has come about with the adoption of new industrial inventions and methods. The transition from the age of wood to that of iron may be largely expressed in terms of speed. To say that we live in an age of change is, of course, a truism, as every age changes, but that change is taking place today with a rapidity unparalleled in the world's history is a social fact of the most profound significance. This acceleration of the tempo of life may be more marked in some fields than in others; it is bound to precipitate conflict in that some individuals adjust to changes more readily than do others, and also adjust differently to change in different phases of their own lives. More particularly in the attitude of young and old to change, in the readiness of the young to adopt new ways, and the reluctance of the older generation to abandon the known for the unknown, is the impact of the conflict felt. Such disparities have, of course, been present in all societies, but the speeding up of industrial life, with the radiation of this influence into all phases of social organization, has loaded the dice in favor of the younger generation and has made more acute than ever before the strife between experience and experiment.

The speeding up of production by improved mechanical devices would seem to be the primary cause of steadily rising standards of living. The credit system, almost universal today in contrast with the cash basis of the nineties, is an expression, not only of industrial expansion, but of a profound psychological change which such expansion has brought in its train, that is, the inability of large numbers of the community to postpone their satisfactions—the straining of every nerve in the great national game of keeping up with the Joneses.

Closely allied to acceleration is the standardization of living; and this also involves profound psychological modifications. Here too, the roots would seem to lie in industrial change. Large scale production tends to uniformity of goods, and this in turn produces uniformity of desires on the part of the consumer. For the worker it has meant routinized performance and a consequent loss of the satisfaction inherent in the task itself which distinguishes true craftsmanship.

"The shift from a system in which length of service, craftsmanship, and authority in the shop and social prestige among one's peers tended to go together, to one which, in the main, demands little of a worker's personality save rapid habitual reactions and an ability to submerge himself in the performance of a few routinized easily learned movements seems to have wiped out many of the satisfactions that formerly accompanied the job." pp. 75-76.

One result of this decline in intrinsic satisfaction is the enhanced value which it puts upon money, i.e., upon an extrinsic mark of the success of one's activities.

"For both working and business class no other accompaniment of getting a living approaches in importance the money received for their work. It is more this future, instrumental aspect of work, rather than the intrinsic satisfaction involved, that keeps Middletown working so hard as more and more of the activities of living are coming to be strained through the bars of the dollar sign." p. 80.

In social as in industrial life money speaks:

"A leading citizen presented this matter in a nutshell to a member of the research staff in discussing the almost universal local custom of "placing" new-comers in terms of where they live, how they live, the kind of car they drive, and similar externals: 'It's perfectly natural. You see they know money, and they don't know you.'" p. 81.

And again:

"Both business men and working men seem to be running for dear life in this business of making the money they earn keep pace with the even more rapid growth of their subjective wants." p. 87.

Probably no phase of motivation, either on the adult plane or earlier with the young child, is more significant than the conflict between intrinsic and extrinsic satisfactions and the tendency to make the latter stand in place of the former. Many of the disorders of the individual as well as of the social order are probably to be traced to this root, and the problem is one of which any fundamental discipline based upon sound principles of mental hygiene will have to take account.

In educational life standardization is everywhere apparent; "the school, like the factory is a thoroughly regimented world." This is true not only of formal education but also of the voluntary activities of students where conformity to the mores of one's accepted group and in particular support of the athletic activities of the school, the "bearcats" of which Middletown boasts, is a *sine qua non* of social tolerance. Similarly, in social life the more spontaneous parties of the nineties have given place to a highly conventionalized type of social intercourse. In religion, too, conformity is the keynote, growing indifference to religious issues being masked under outward acceptance. Likewise in politics Middletown looks askance at independent thinking and expects every voter to stick to a straight party ticket. As in religion, party principles seem to become less important as party

organization and party loyalty are stressed. The individual who disagrees with the group is ostracized or regarded as "queer"—he is the "lone wolf" of the pack. Non-conformists usually tend to mask their disagreement by silent withdrawal into themselves.

What are the social values generated in a society such as this where the emphasis rests on the acquisition of goods, and on standardization of behavior? An English reviewer has aptly described *Middletown* as the "anatomy of Main Street"—which puts in a nutshell the general impression of flatness and spiritual aridity which the book conveys. One wonders sometimes if the authors have overstated the regression in cultural values from the Middletown of the nineties—yet a glance at the life around us would confirm many of their generalizations. In academic life, for instance, one notes the disappearance of the "eccentric" who gave zest to the college scene of a generation ago. James' generalizations about the mental set of the young professional man are probably less true than they were when he wrote them: our young ministers now look and talk like commercial travelers; our artists like stock-brokers; presidents, like promoters; in other words, instead of a set of distinctive moulds we tend more and more to one type as representative of a very large class in society. While the impulse to be like others is strong in us all, and while it gains strength from the prevalence of mass production, there exists just as powerfully the desire for variety. When that desire is inhibited by the prevalence of common standards it finds expression in the increasing emphasis on change. Fashions change overnight, and this applies to ideas as well as to material things. Thus, while we go in lock-step, we are going faster and faster. These two main features of present-day life, standardization and change, would thus seem to be related, not only as common fruits of our present economic conditions but as mutually reinforcing one another.

Why, one wonders, are we more complacent about living in Middletown than we are about contemplating such an existence when the mirror is held up for us by these authors? Probably just for the reason that our appetite for change is being satisfied at a rate never before possible in the history of mankind. We are like children in a newly-furnished nursery, running distractedly from one toy to another, and all the time demanding more before we have learned to use what we have. We are diverted, but not satisfied.

The authors of *Middletown* are wary of theoretical generalizations; they do, however, in their final chapter indicate certain leads for further investigation which their present study has suggested. These may be summarized as follows:

1. The rate and direction of social change.
2. The emotional conflicts precipitated by such changes, and the protective mechanisms which society must generate against the social tensions resulting from change.

3. The value of accepted institutions as interpreted in the light of human satisfactions.

Coming of Age in Samoa

It is a far cry from Middletown to Samoa, and if change and social pressure is the keynote of the one society the other presents an often amusing counterfoil in showing the subtle resistance which a static society offers to attempts at external regulation. In Samoa Christian ethics sit loosely on pagan license. The church, for example, condemns illicit sex relations, therefore Samoans discreetly refrain from joining the church till they are married and ready to settle down. Samoa undoubtedly has taboos of its own, as every society must, but they are not those of Western civilization, and those critical phases of adjustment which in our society are attended with storm and stress are easily and quietly met in Samoa. The mysteries of birth, death, and sex, around which so many of our conflicts and neuroses gather, are not mysteries for the Samoan child and youth, as life is lived in the open with little secrecy or sense of shame. Strife between parents and children, so common a motive in the domestic drama of America and Europe, is solved in Samoa by the simple expedient of the young malcontent leaving the parental roof for that of an uncle.

What lies at the root of these differences, and what significance have they for our social reconditioning? As in *Middletown*, the methods of the cultural anthropologist are employed to spell an answer to this riddle. Miss Mead, a member of the staff of the American Museum of Natural History, spent a year and a half in a Samoan village, learning the language, making friends with the people, and finding out at first hand in particular how youth fits into the social pattern of this civilization. Her problem is thus more restricted than that of *Middletown*; it is also different in that Middletown was studied for its own sake, whereas Miss Mead's study of Samoan youth was undertaken to throw light on the problems of adolescence in America (pp. 11, 234). Whether the indirect is as effective as the frontal attack in this difficult field may be questioned. As a matter of principle, one might feel that any phase of life or cultural setting should be interpreted in its own terms, or by means of antecedents. Comparison of civilizations would then be a distinct rather than a subsidiary undertaking.

One striking contribution has, however, been made by Miss Mead through the indirect method, she has demonstrated that the conflicts of adolescence are a function of environment rather than of individual development. Where social pressures are relaxed, adolescents make the transition to adulthood as easily as with us they make the earlier one from infancy to childhood.

Is the logic of the situation, therefore, the removal of social pressure? Miss Mead discusses the contrasts between American and Samoan civilization to discover the roots of difference. She points out that in Samoa shallowness is conventionalized, "no one plays for very high stakes, no one

pays very high prices, no one suffers for his convictions or fights to the death for special ends." The categorical imperative thus has small appeal, "no one is hurried along in life or punished harshly for slowness of development." A premium is set on moderation in feeling towards most things. The range of choice in conduct and attitude is thus much more limited than in America, and Miss Mead believes that the lack of neuroses in Samoa is largely due to this lack of forever trying to identify the self with some among many conflicting standards. She has a piquant description of the American contrast:

"Our young people are faced by a series of different groups which believe different things and advocate different practices, and to each of which some trusted friend or relative may belong. So a girl's father may be a Presbyterian, an imperialist, a vegetarian, a teetotaler, with a strong literary preference for Edmund Burke, a believer in the open shop and a high tariff, who believes that woman's place is in the home, that young girls should wear corsets, not roll their stockings, not smoke, nor go riding with young men in the evening. But her mother's father may be a Low Episcopalian, a believer in high living, a strong advocate of States' Rights and the Monroe doctrine, who reads Rabelais, likes to go to musical shows and horse races. Her aunt is an agnostic, an ardent advocate of woman's rights, an internationalist who rests all her hopes on Esperanto, is devoted to Bernard Shaw, and spends her spare time in campaigns of anti-vivisection. Her elder brother, whom she admires exceedingly, has just spent two years at Oxford. He is an Anglo-Catholic, an enthusiast concerning all things mediaeval, writes mystical poetry, reads Chesterton, and means to devote his life to seeking for the lost secret of mediaeval stained glass. Her mother is of a quietistic frame of mind, very much interested in Indian philosophy, a pacifist, a strict non-participator in life, who in spite of her daughter's devotion to her, will not make any move to enlist her enthusiasm." pp. 202-3.

Whatever this is, it certainly is not Middletown.

While her analysis of the differences between American and Samoan society is suggestive, Miss Mead never seems quite to come to grips with the causes underlying these differences. As the writers of *Middletown* imply that in economic conditions lies the impetus towards social change, so one might surmise that in Samoa, economic or, more fundamentally, climatic conditions are responsible for the slower rhythm of living, the greater freedom within a somewhat narrow range, and the conspicuous lack of extremes in individual development. Where a livelihood is easy to obtain, effort becomes a non-adaptive form of behavior. Thus, while America sets a premium on drive and initiative, such qualities are actually a disadvantage in Samoa.

Miss Mead is, of course, too acute to argue that because life is easier in Samoa it is therefore better. She admits that personality is not valued as it is in Western civilization, even while she questions the price paid for our Western development. The strife of standards may be damaging to the

weaker members of society even while it produces the conditions which bring the stronger to a fuller measure of their capacities.

One questions whether she has not overdone the traumatic effects of American civilization. That our educational practice both in the home and in schools should be revised in order to minimize stress at adolescence would be generally accepted. But the psychological flatness of the Samoan scene sets up a strong reaction in favor of our more vigorous and diversified, though difficult ways of living. Even "magic Middletown" seems a theater of infinite variety compared with Samoa. The more acute development of our capacity for emotional experience, the more delicate nuances of feeling, the greater range and variety of living, seem worth while even at the price of a large measure of social and individual restraint. Nowhere is this more true than in respect of sex. Here, even when formal education has done all in its power to make possible a natural adjustment, self-discipline and control must remain as the sanctions of the individual's most intense and permanent forms of enjoyment. The moral extends to other phases of social relationship; ease and breadth are purchased at the price of intensity and fineness of development. Western life has chosen the latter alternative, and a revision of its customs in the light of its own experience rather than those of a fundamentally different civilization is therefore indicated.

The Psychology of the Adolescent

Mrs. Hollingworth's book offers just such a plan for the study of adolescence. This volume is the outgrowth of a series of lecture courses and is designed primarily as a text for college students. Adolescence is here considered topically under its various aspects, physical, social, economic, religious, etc. While there is little that is new in this book, the material available on the subject of adolescence is organized and presented concisely and clearly. In particular, certain views of the child-parent relationship largely derived from Freudian teaching, such as the necessity for psychological weaning, and the importance of emotional freedom are set forth in unambiguous but moderate terms. Indeed, one is impressed throughout by the balance and discrimination of the author.

But at its best, and admitting that this best is very good, this book remains essentially a text-book presentation of adolescence. It lacks the vitality, and conviction of first-hand experience which Miss Mead is able to convey in respect of her Samoans. Its methodology illustrates what we tried to point out at the beginning in regard to the futility of expecting that the sum of the parts will give the whole. The compilation of the studies of a host of isolated investigators may have subsidiary uses, but it does not give us a vicarious experience of this life-process itself. It leaves us with the dissected body, not with the living organism. This is not to say, of course, that Mrs. Hollingworth is uniquely at fault in this respect; her method is simply the one which we all pursue when we work

up text-book courses on a given subject—except that she has done her work better than most of us do.

Therefore, while we have questioned the plan of reviewing American customs in the light of Samoan life, and while we prefer the direct approach to problems of adolescence, it still seems that Miss Mead's method of first-hand contacts with the people of whom she writes, and the reproduction, as faithfully and realistically as possible of the customs and attitudes which she has discovered, might be utilized with advantage in a direct attack on our own problems of adolescence. Adolescence remains the *terra incognita* of developmental psychology at the present time, but this is not because the problem has been ignored, but because it has been attacked by the wrong method. Like all unexplored lands it is subject to the wildest of unconfirmed rumors. Until some daring pioneer explores the normal adolescent at first hand, living with him, gaining his confidence, understanding his difficulties and respecting his attitudes, we shall not make much progress beyond that initiated by Stanley Hall.

In short the method we suggest for adolescence would be that of *Middletown*, the new game of regarding the familiar occupations and accustomed experiences of ourselves and those about us as the proper objects of scientific enquiry. Such studies of human behavior have heretofore been the prerogative of the literary man. Thus, for example, many of our best studies of adolescence, whether satirical or romantic, are in fiction or the drama, but interesting as such studies will always be, they must remain subsidiary to careful scientific studies. Even biography, interesting for the confirmatory evidence which it often affords, is limited by reason of its retrospective inaccuracy, and the difficulty of verifying statements after the lapse of years. Whether the new picture of adolescence derived from the pursuit of such a method will confirm or contradict the old is less important than the degree to which it will be able to reproduce reality.

Difficulties of Child Development

Miss Chadwick's book brings us to the next stage in our descending age scale, the period broadly denominated as childhood. Miss Chadwick is an English woman with a nurse's training, who is evidently a practicing psychoanalyst. Under what auspices she works is not indicated in the book. Her point of view is Freudian, and the book is a general discussion of problems of child training—presumably based on her clinical experience. But one here meets with the difficulty, not uncommon with writers who rely on clinical findings, that clinical experience is asserted as the basis of the argument without cases being cited in sufficient detail for the reader to follow the logic of the situation. The reader is thus left with an uneasy feeling that the premises do not necessitate the conclusions, but he is not sufficiently in possession of the facts to say why he disagrees. As this

book is designed for parents as well as for professional workers in the field of child study, this book seems also open to criticism for the reason that it emphasizes maladjustments and problems rather than the normal course of the child's development. This is the great pitfall of the clinician, but experienced specialists such as Dr. Thom have recognized this and consciously set themselves to overcome it, turning their knowledge of extreme cases to the interpretation of the more moderate and frequent, but essentially similar problems of milder maladjustments. Miss Chadwick apparently feels no such obligation. One doubts if the book will carry conviction to any but already convinced Freudians.

Children in the Nursery School

In Miss Johnson's book we are on the firm ground of accredited experience. It is now two years since this book was published, so that one might apologize for reviewing it at so late a date were it not that the work is of more than passing interest. It is the first really first-rate analysis of nursery principles that has yet appeared. The book has a double interest, both as a contribution to genetic psychology and as a discussion of educational procedures. Not that these interests are in any sense disparate; in this book educational methods are always presented in dependence on studies of the child's development. Such studies are not conceived as depending upon any specialized laboratory situation but rather as involving the careful observation of the child in the ordinary situations of a well-conducted nursery school with a view to discovering what he needs, and how these needs can be met in a regulated environment. Thus *Growth* is the key word of the book, expressing these two aspects of a genetic study of the development of the preschool child and the devising of an educational environment which shall feed the growth needs of the child.

This is, of course, the emphasis of all newer trends in education, the attempt to fit the environment to the needs of the child instead of forcing the child into conformity with a ready-made environment. In studying the needs of the child both his special aptitudes and his general capacities and requirements must be explored. While special abilities in rhythm, language, construction, etc., are discussed, this book in the main emphasizes those requirements which are common to all children of this age. An answer is sought to the question, what are the common requirements for growth?

Miss Johnson is a gentle but discerning critic, and her convictions must at times run counter to common parental practice, particularly as regards the social environment of the child. Again and again she illuminates a debated question by asking what really ministers best to the needs of the child? For example, is a rigid insistence on manners desirable for the young child? What we really desire, she says, is a friendly response in the child. An unobtrusive but genuine friendliness and consideration on

our part will normally provoke such a response more readily than insistence on formal politeness. The latter may defeat its purpose by making the child self-conscious or negativistic. The spirit is here what matters, the letter will take care of itself as the child grows older and becomes increasingly susceptible to group suggestion in such respects. Again, should every phase of the day's routine be explained to the young child? No, for the routine is not inherently interesting to the child. His cooperation should be assumed, and the matter carried through by the adult, who assumes the responsibility but utilizes the child's interest and cooperation when they are manifested. Those who work with young children will realize how stimulating and reassuring is this reasoned common sense applied to the problems of the daily management of children. It is when theory is brought down to the level of practical detail in such a way that the inherent reasonableness or otherwise of a procedure is demonstrated that it becomes possible to substitute principles for rules in the direction of our conduct.

The distinction between the routine of the nursery school as the disciplinary factor in the child's experience in distinction to his play time which furnishes the opportunity for creative self-expression and training in social adjustment is implicit in all Miss Johnson's writing. The emphasis, however, is less on the schedule and the rules than on the use of the freedom which these exist to secure. The main part of the book is devoted to a discussion of what constitutes a favorable environment, physical and social, for the growth of the child, and then to factual records of how individual children avail themselves of the opportunities which such an optimum environment offers.

How far the philosophy of freedom for growth can be extended into the upper age levels of childhood and adolescence is a question of the profoundest practical interest. An environment deliberately designed and regulated to provide a maximum of physical activity, and of social opportunity with those of one's own age level, together with protection from physical dangers and with a minimum of adult stimulation, justifies itself by its results in the preschool level. But, as the child grows older the problem of adjustment to increasing social pressure becomes more and more acute till we reach the adult level of Middletown where individual freedom seems to have disappeared under the overwhelming weight of social compulsion. Whether the nursery school with its emphasis on freedom and initiative contains within itself the germ of social regeneration is a question for the future to answer. Its freedom from official control, its lack of formal curriculum, its indifference to any considerations extraneous to the welfare of the child, makes it at the present time a crucial field for educational experiment. If it escapes becoming stereotyped in its procedures, thus avoiding the fate of earlier similar experiments, we shall have to thank persons like Miss Johnson, who bring the play of a critical but keenly sympathetic intelligence to the continuous revision and evaluation of its procedures.

Infancy and Human Growth

In Dr. Gesell's latest work the fundamental concept of growth is discussed both in more abstract fashion and with more specific detail than in any of the studies so far reviewed. In the opening chapters growth is dealt with from a more or less philosophic angle in an attempt to arrive at a general concept by a review of the approaches to the study of growth which are being made by the various biological sciences. When, however, the discussion is narrowed to the writer's special field, and to human infancy in particular, the studies become detailed and precise.

The magnification of time values as one approaches the origin of the human growth scale is elaborated, and graphic methods to express adequately the diminishing increments of growth with increasing age are discussed. While in one sense this book adds nothing that is fundamentally new to the methods described in *The Mental Development of the Pre-School Child* it does develop the methods there introduced to a much greater degree of accuracy. Thus instead of comparisons of three with six months, or six with nine months, the scale is now finely graded to record differences of monthly intervals, and most of the studies presented are limited to the first year of life. One shift in emphasis in method calls for comment. While the plan of a comparative diagnosis, used so widely in the earlier book is not abandoned, the tendency is now to make repeated examinations of one child at frequent intervals, so that his growth is measured in terms of his own progress from month to month as well as in comparison with that of other individuals. Thus while each child is measured in terms of certain growth norms derived from a study of many subjects at a given age, increasing attention is also being given to the *history of growth* of each individual. This employment of the longitudinal method in its most thoroughgoing form promises to enrich the knowledge derived from the application of norms, a static method, with a true developmental picture by which changes in a time sequence can be adequately represented.

A series of careful examinations of the same child according to a standardized procedure affords more accurate grounds for prediction than does the use of the comparative method alone. When a worker as meticulous as Dr. Gesell states his confidence in the predictive value of very early performance, one may well believe that progress of the greatest significance, both theoretically and in relation to practical measures, such as remedial treatment, adoption, etc., has already been made.

Special studies of twinning, glandular and nutritional factors, prematurity and its effect on growth, form part of the general analysis of growth trends. A detailed description of the physical equipment of the Yale Psycho-Clinic, in particular of the visionless screen in the guidance nursery, and of the photographic devices employed in recording the reactions of children is included in this work.

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HAMILTON, G. V. *A Research in Marriage*. New York: Albert & Charles Boni, 1929. Pp. 570. \$10.00

HAMILTON, G. V. & MACGOWAN, K. *What is Wrong With Marriage?* New York: Albert & Charles Boni, 1929. Pp. 319. \$3.00.

It is not difficult to criticize the first of these books. It has had both serious and finical criticism. The book necessarily draws its experiences from a highly selected group of intelligent people, and possibly, as is frequently asserted, the investigation attracted a disproportionate number of radicals, especially women. Such blemishes merely forbid dogmatizing on the basis of Hamilton's findings. He, doubtless, would be the last to encourage such a misuse of his report. The fact remains that this is the first serious effort, carried on in the spirit of science, for a term of years, to get at the sex history and attitude of individuals who were not coming to a specialist because of personal difficulty, but who were willing to contribute with frankness such sex information as their personal career contained. The reader who appreciates the poverty of our knowledge of normal sex life will frankly recognize that this book belongs to the pioneering period in a retarded science. Certainly he will abstain from the wolf-spirit toward a new departure, a reaction which appears often enough in the reviews of the sociologist to give the impression that he is the most unsocial of the scientists, frankly recognizing that under present circumstances no thoroughly satisfying scientific treatment of sex can be expected. The sociologist may well welcome this book for the value it has. It is the result of a detailed personal examination of a hundred volunteer husbands and wives which was carried on in New York during a term of four years. The book abounds in statistics tabulating the results.

The questions asked and answered cover a wide field: the economic problems of marriage; the influence of mothers, mothers-in-law, and other friends and relatives upon the sex history of the individuals; problems of conception, contraception, and motherhood; sex adjustments before, during, and after puberty; marital and extra-marital sex relations; the feeling of inferiority along lines of sex; masturbation, trends toward incest and homosexuality. The book has an extensive index. It is clearly written and to the specialist at least is extremely interesting.

The second book is the outgrowth of the effort of Kenneth Macgowan to put in popular form the results of Dr. Hamilton's study. Dr. Hamilton tells us that it went beyond its original purpose, and is the product of Macgowan's reaction to Hamilton's investigation. If so, it hardly seems reasonable to build a book upon any individual's thinking and feeling toward such a study, even if he brings to his task the journalist's ability to popularize the material into a form that will make it commercially profitable. It provides an illustration of the growing tendency of the American scientist, due perhaps to a costly neglect of literary expression, to call upon the journalist to dilute and refashion material which, it is assumed, cannot

without an interpreter interest the general reader. The best part of the book is the introduction by Dr. John Watson, a scientist who never lends his pen. In so brief form there is no stronger indictment of the stupidity and danger of our present taboo against knowledge of sex. It ought to be required reading for every adult man and woman with an intelligence above that of the moron. Even a scientist will read it with profit, but if he has interest in the content of the rest of the book he will wisely insist upon Hamilton's own clear and able presentation.

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HOLLINGWORTH, H. H. *Vocational Psychology and Character Analysis*. New York: Appleton, 1929. Pp. 409. \$3.00.

This volume is a telescoping of two former books by Professor Hollingworth, namely *Vocational Psychology*, which appeared in 1916, and *Judging Human Character*, which appeared in 1922. Those books are so widely known from their use as texts that extended comment is unnecessary. The one-volume amalgamation is undoubtedly a convenient form in which to have the material formerly contained in two volumes, the topics of which overlapped considerably. Rewriting has made it possible for the author to include new illustrative material that has appeared since 1922 and to add several new chapters such as one on "Interests as Vocational Determinants."

Hollingworth, in his preface, calls attention to the fact that many of the fields of work and the methods which were outlined in his earlier books are now handled each by its own specialist. The reviewer found great interest in checking the material with an eye on the developments which have taken place since the publication of the first book. One gets a sense of present-day drift of interest: The emphasis upon the diagnosis of temperament and character; the more critical conclusions concerning the relation of intelligence to vocational aptitude; the development of special techniques in industrial psychology for its own purposes. The book, says the author, is neither a handbook of vocational guidance nor a manual of personnel procedure; it is a survey of the results of scientific inquiry basal to both guidance and selection. It is interesting to note that in many such instances as the unreliability of photographs, letters of application, and self-estimates as methods of character-analysis, later investigations have confirmed the results of pioneer investigation, much of which was carried on by Hollingworth himself. Later investigation has also suggested new points of view; the use, for example, of a self-estimate in a diagnostic way.

Vocational Psychology and Character Analysis shows certain improvements on the technical side over the earlier volumes; for example, the setting off of quoted material by smaller type. An enlarged bibliography is also a new and valuable feature. The volume will serve a most useful purpose as a textbook for beginning classes in vocational psychology and as a reference work for the general reader.

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